

**7th Meeting of the North Pacific Fisheries Commission
REPORT**

22-24 March 2023

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REPORT

Agenda Item 1. Opening of the Meeting

Welcome Address

1. The Chair of the Commission (Dr. Vladimir Belyaev) called the Seventh meeting of the North Pacific Fisheries Commission (COM07) to order and presented his opening remarks. He noted the NPFC is responsible for one of the most productive ocean areas in the world and called on Members to work with flexibility and focus to improve the status of Pacific saury, mackerel and other stocks. Dr. Belyaev welcomed the European Union to a meeting of the Commission for the first time as a Member. He also thanked the Secretariat for progressing the work of the Commission despite not being able to hold in-person meetings since 2019, and appreciated Japan for hosting FAC05, TCC06 and COM07 in Sapporo.
2. Mr. Masaki Kondo, Director General of the Bureau of Fisheries of the Hokkaido Government, welcomed participants to Sapporo on behalf of the host country. He highlighted the importance of addressing the plummeting stock of Pacific saury, stressing the importance of the species not only for Japan's seafood industry as a whole but also for local communities, particularly in Hokkaido, that depend on it. He urged the Commission to re-double its efforts to overcome disputes by relying on science and enhancing cooperation. Finally, he expressed hope that the sense of spring in the air this week would inspire a productive meeting (**Annex A**).
3. COM07 was attended by Members from Canada, China, the European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Panama attended as a Cooperating Non-Contracting Party (CNCP). Observers included Pew Charitable Trusts, World Wildlife Fund, International Monitoring Control and Surveillance Network, Organization for Regional and Inter-regional Studies (ORIS)-Waseda University, the Deep Sea Conservation Coalition, Australian National Centre for Ocean Resources and

Security (ANCORS), the North Pacific Anadromous Fish Commission (NPAFC) and the Fisheries and Resources Monitoring System (FIRMS) of the Food and Agriculture Organization of the United Nations.

1.1 Appointment of Rapporteur

4. Dr. Shelley Clarke was appointed rapporteur for COM07.

1.2 Adoption of Agenda

5. The provisional agenda, as presented in **Annex B**, was adopted. The list of documents and list of participants are attached as **Annex C** and **Annex D**.

1.3 Meeting Arrangements

6. The Executive Secretary (Dr Robert Day) presented the meeting arrangements (NPFC-2023-COM07/TCC06/FAC05-MIP01).

Agenda Item 2. Membership of the Commission

2.1 Status of the Membership

7. Korea, as the depositary of the Convention, informed COM07 that the European Union (EU) deposited its instrument of accession to the Convention on 21 Feb 2022. With this action the membership of the Commission reached nine Members.
8. The EU stated that it was pleased and honored to participate in the NPFC as a full Member and that it was looking forward to contributing to the conservation and sustainable management of NPFC marine biological resources and the protection of marine ecosystems while giving full effect to its membership through the adoption of its fishing plan (**Annex E**).

2.2 Cooperating Non-Contracting Party (CNCP) Status of Panama and Other Applications

9. Panama presented a statement and extensive supporting information (NPFC-2023-COM07-IP07) to COM07 (**Annex F**).
10. The TCC Chair informed COM07 that TCC06 had a robust discussion regarding renewing Panama's CNCP status but could not come to consensus. Therefore, TCC06 decided to refer the issue to COM07 for consideration.
11. Some Members supported Panama's application, noting the efforts Panama has made

in recent years but also the ongoing need to better control transshipment activities in the Convention Area.

12. Other Members expressed continuing concerns about Panama's ability to exercise appropriate flag State control, given re-occurring incidents involving carrier vessels flagged to Panama.
13. One Member noted that the issue of CNCP participatory rights had not been discussed at TCC06 and suggested that if COM07 granted CNCP status to Panama for the coming year, Panama's participatory rights should be limited to transshipment activities in the Convention Area.
14. **COM07 acknowledged the additional information provided by Panama and encouraged it to continue improving the monitoring, control and surveillance of its flagged vessels engaged in fishing operations in NPFC.**
15. **COM07 agreed to renew the CNCP status of Panama from 25 March 2023 until COM08 with participatory rights limited to carrier and bunker vessels, and also agreed that any new failure by Panama to comply with the Conservation and Management Measures adopted by the Commission will be dealt with in accordance with Rule 10, paragraph 18 of the NPFC Rules of Procedures, including considering the revocation of Panama's CNCP status.**
16. Panama thanked the Commission for renewing its CNCP status and pledged its full compliance with the NPFC CMMs as a firm partner in the fight against IUU fishing.

Agenda Item 3. Report from the Secretariat

17. The Executive Secretary, in accordance with Rule 6 of the Rules of the Procedure, provided a summary of highlights of the Secretariat's report on the Commission's activities for the 2021/2023 period (NPFC-2023-SR Secretariat's Report) including an update on the NPFC Data Management System (NPFC-2023-TCC06-IP02) distributed in advance of the meeting. His summary highlighted the heavier workload of the Secretariat in supporting meetings that needed to be held online or in hybrid form, and in parallel, the Secretariat's efforts to facilitate online access to data and other new other information technology services.
18. COM07 noted the Secretariat's report for February 2021-March 2023.

Agenda Item 4. Performance Review of the Commission

19. Dr. Penny Ridings presented the report of the NPFC Performance Review Panel (**Annex G**) noting that three other members of the Panel are attending COM07. All work amongst the team and with respondents was accomplished virtually and the report was completed in August 2022. A total of 68 recommendations were

produced in six areas in accordance with the Terms of Reference: science, conservation and management, compliance and enforcement, decision-making and dispute settlement, international cooperation, and finance and administration. The review noted that the Commission draws upon a large amount of international expertise to manage a diverse array of stocks, highlighting work on management strategy evaluation (MSE), harvest control rules (HCR), and a science-management dialogue. However, challenges in the form of data gaps for target species, lack of ecosystem information, and declining stocks are significant. Additional issues for the Commission going forward include the heavy workload of the subsidiary bodies, the lack of action on scientific advice at the Commission level, complications arising from stocks moving in and out of EEZs and the Convention Area, and the effects of climate change. Given the magnitude of these challenges, the Panel advised that prioritization of issues will be critical and that its report can be helpful in this regard.

20. Members thanked the Panel for their useful recommendations, adding that the Panel's report also serves as a valuable retrospective of all the work of the Commission.
21. The FAC Chair (Mr. Dan Hull) noted that FAC05 had considered the options for actioning the Performance Review Panel's work contained in NPFC-2023-FAC05-WP08 and generally supported the option of the Secretariat coordinating a process with NPFC bodies to provide feedback on the Panel's recommendations to COM08.
22. **COM07 agreed to task the Secretariat with developing a matrix, taking into account those of other RFMOs and CCAMLR, for the recommendations of the Performance Review Panel showing each recommendation, its priority and timeframe, the responsible body, the activities undertaken to date and their status (e.g. 'pending', 'significant progress', 'completed', etc.)**
23. **COM07 agreed that progress on actioning the recommendations of the Performance Review should remain as an agenda item for COM08 and subsidiary bodies.**
24. **COM07 agreed that the Performance Review Panel report be made publicly available on the "Key Documents" section of the NPFC website.**

Agenda Item 5. Report of the 6th and 7th Scientific Committee Meeting

25. The Chair of the Scientific Committee (Dr. Janelle Curtis) presented a summary of work by the Scientific Committee (SC) over the period 2021-2022. These reports are attached as **Annex H** for SC06 and **Annex I** for SC07. The SC and its formal subsidiary bodies, which are the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA), the Small Scientific Committee on Bottom Fish and

Marine Ecosystems (SSC BF-ME), and the Small Scientific Committee on Pacific Saury (SSC PS) met formally over 19 days in 2021 (NPFC-2021-SC06-Final Report) and over 23 days in 2022 (NPFC-2022-SC07-Final Report). There were also intersessional meetings of the SSC PS as well as intersessional meetings of seven informal Small Working Groups. The TWG CMSA intends to select stock assessment models for chub mackerel at its next meeting in September 2023. The SSC BF-ME wishes to inform COM07 that catches and fishing effort for North Pacific Armorhead and splendid alfonsino are at historical lows. The SSC BF-ME recommended revisions to CMM 2021-05 and CMM 2019-06 concerning encounter thresholds and move-on distances for VMEs, and recommended a process used by Canada for identifying VMEs as one of the NPFC's processes. The SSC PS noted that Pacific saury catches have been at a historical low for the past few years. The SSC PS and SC will continue to support the work of the Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) during the coming year (see Agenda Item 8).

26. Members expressed appreciation for the large amount of work accomplished by the SC in the period since the last meeting of the Commission.
27. Some Members requested clarification on when the stock assessment and scientific advice on chub mackerel would become available.
28. The SC Chair, as well as the Chair of the TWG CMSA (Dr Kazuhiro Oshima), responded that the formal stock assessment will be conducted after the stock assessment models are selected in September 2023 and a data preparation meeting is held in early 2024. They noted that subsequent work on HCRs is planned, similar to that underway for Pacific saury.
29. Some Members considered the work on chub mackerel is a priority and looked forward to its timely completion.
30. Russia stated that in para. 86 of the SC07 report, the SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fishery operation plan.
31. The EU considered that its updated fishing plan for chub mackerel provides a useful summary of the latest data and scientific information available on this stock and a robust assessment of potential impacts on the target stock, possible bycatch species and the ecosystem. The EU further stated that based on the latest information available, the stock appears to be in quite healthy state and in the absence of any conservation concerns expressed by the SC for this stock, it should be possible for the Commission to discuss and hopefully allow the EU to exercise its participatory rights in the Convention Area, despite the absence of specific advice on the EU fishing plan. The EU also inquired about the reasons that did not allow the SC to

finalise the stock assessment of chub mackerel after many years of efforts and how this process could be facilitated.

32. The EU also queried whether there is an agreed NPFC document specifying the scientific data to be provided to the Commission for all key species and whether such a document would facilitate the work of the SC.
33. The SC Chair noted that there has only been a stock assessment for one of the Commission's eight priority species thus far (Pacific saury) and that Members contributed the relevant data for that assessment. The SC Chair considered that a policy document on the sharing of scientific data could be useful.
34. Japan noted that chub mackerel is a straddling stock of which the spawning ground and the main distribution area lie within the Japanese EEZ. Japan stated that due to Japanese fishers' great efforts to restore the stock, it has been at around the MSY level in recent years, according to Japan's stock assessment. However, since last year, catches in Japanese coastal waters have drastically decreased, and Japan is strongly concerned about the situation. Japan considered that under UNFSA's provisions regarding management of straddling stocks, the NPFC has to take conservation and management measures that do not undermine the effectiveness of Japan's management. In this regard, Japan requests the SC to complete the stock assessment of chub mackerel as soon as possible, so that effective management measures on chub mackerel can be introduced in the near future.
35. The United States and an Observer underscored the importance of the ongoing SC work on Vulnerable Marine Ecosystems (VME), and encouraged the SC to make reference to United Nations General Assembly Resolution 77-118 on Sustainable Fisheries which calls upon States to ensure application of the precautionary principle and on RFMOs to adopt CMMs to prevent the occurrence of significant adverse impacts.
36. An Observer noted that managing the impacts on VMEs through the use of "move-on rules" can lead to gradual degradation of habitats and questioned the high encounter thresholds for sponges proposed by the SC.
37. The SC Chair responded that the SC plans to conduct further reviews by taxa and by gear to better refine the encounter thresholds.
38. **COM07 accepted the report and the recommendations of the Scientific Committee from SC06 (2021) and SC07 (2022), noting that decisions regarding the amendment of CMMs will be considered by COM07 under Agenda Item 9, and the participation of NPFC in the Food and Agriculture Organization of the United Nations (FAO) Fisheries and Resources Monitoring System (FIRMS) will be considered under Agenda Item 10.**

Agenda Item 6. Report of the 6th Technical and Compliance Committee

6.1 *Review of the TCC06 Report*

39. The Chair of TCC (Ms. Alisha Falberg) presented her report on the outcomes of TCC06 (**Annex J**).
40. Members noted that a number of items were discussed at TCC06 but not resolved and that those discussions would continue at COM07 and be reported under other agenda items.
41. The EU suggested that future TCC agendas allocate more time to important issues such as IUU Vessel Lists and the Compliance Monitoring Report.
42. **COM07 adopted the report and recommendations of TCC06 including:**
 - (a) **Renewing para. 14(c) of the Data Sharing and Data Security Protocol for VMS Data until COM08 (TCC Recommendation 4)**
 - (b) **Incorporating the Data Sharing and Data Security Protocol for VMS Data into the VMS CMM (TCC Recommendation 5)**
 - (c) **Replacing the second instance of the word “Commission” with “Secretariat” in para. 31 of CMM 2021-09 (TCC Recommendation 6) (Annex K)**
 - (d) **Amending the vessel registry requirements to remove the field “pending IMO #” and remove the outdated field description from CMM 2021-01 Annex 1 (TCC Recommendation 11) (Annex L)**
 - (e) **Tasking TCC’s SWG-OPs with continuing its work to consistently define what constitutes a serious violation across all CMMs (TCC Recommendation 13)**
 - (f) **Tasking TCC with the activities contained in the TCC Work Plan for 2023-2024 (NPFC-2023-TCC06-WP22 rev1) (TCC Recommendation 17)**

6.2 *Adoption of IUU Vessel List for 2023*

43. The TCC Chair informed COM07 that the Provisional IUU Vessel List for 2022/23 includes 28 vessels which are proposed to be added to the existing IUU Vessel List which currently contains 36 vessels.
44. The United States provided additional information and updates to COM07 regarding the vessels it nominated to the NPFC IUU Vessel List:
 - (a) One Russia-flagged: Russia clarified the information it provided regarding the inclusion of its vessel on the draft NPFC IUU Vessel List and the action it took as flag State in response to the refusal of the attempted boarding and inspection. The United States had notified appropriate Russian contacts of the intent to board the vessel and the subsequent boarding denial by the Russian vessel on 10 Oct 2021. After a delay in processing the notification, the flag State authorities notified the

master of the vessel that they should accept the boarding and inspection on 15 Oct 2021. At that point, the USCG inspection vessel was no longer in the vicinity of the vessel to conduct the boarding. Russia acknowledged the vessel had committed a serious violation by refusing the boarding and that the vessel was obliged to accept the boarding regardless of the extenuating circumstances referenced, such as questions over interpretation of the voluntary COVID-19 best practice guidelines. Russia directed the vessel to return to port after leaving the Convention Area. Russia inspected the vessel in the port of Korsakov, Sakhalin after the vessel remained in quarantine. The Russian Coast Guard inspected the vessel two more times and found no evidence of other violations of NPFC CMMs. The period of inspection and loss of fishing days for the vessel lasted from 09 Nov 2021 to 09 Dec 2021. Russia also took actions as a flag State to clarify the requirement to accept high seas boarding and inspection under the NPFC and took steps to address internal communication issues that had contributed to the delay in directing the vessel to accept the boarding. Russia stated this issue should be treated in the context of non-compliance rather than the IUU vessel list as Russia had already taken appropriate actions to address the refusal of boarding as a flag State. Russia committed to direct its vessels to accept future boardings consistent with CMM 2021-09 to promote compliance with NPFC CMMs and assist in the Commission's efforts to combat IUU fishing.

- (b) China-flagged fishing vessels nominated by the United States: China stated that it consistently adhered to combating IUU fishing activities together with NPFC Members and accepted most HSBI activities according to NPFC CMMs, but it had instructed fishing vessels flagged under its authority and operating in the Convention Area to refuse some boardings by authorized inspectors under CMM 2021-09 due to issues of interpretation regarding the nature of some provisions of the COVID-19 best practices adopted by COM06. China claimed that it had investigated the activities of these vessels and identified no other serious violations. The United States, supported by most other Members, noted the binding obligations to accept boardings in CMM 2021-09 are not affected by the voluntary best practices document and clarified that the voluntary recommendations contained in Annex F were not a legitimate basis to deny boardings. China indicated the refusal to accept boardings should be considered in the context of assessing the compliance of flag States with existing HSBI obligations, and not an IUU vessel listing issue, as the vessels were acting at the direction of the flag State. The USA, supported by several other Members, indicated that it considered China to have been non-compliant with the relevant obligations in CMM 2021-09. Noting the conditions of the COVID pandemic had changed, China agreed to the proposed

updates to the COVID best practice guidelines and is willing to join the consensus on the acknowledgement of the voluntary nature of the updated best practice guidelines related to COVID. China committed, as the flag State, to direct vessels to comply with future boardings, consistent with CMM 2021-09 to promote compliance with NPFC CMMs, and assist in the Commission's efforts to combat IUU fishing.

45. **COM07 decided not to include the United States-nominated vessels in the 2023 NPFC IUU Vessel List.**
46. Japan reported to COM07 regarding three vessels which appeared to be conducting transshipment operations with an unauthorized carrier vessel. Japan received information from China, the flag State of the vessels, that the vessels were confined to port pending a full investigation of the alleged transshipment of fish and have been de-registered. The vessels have also been fined for transferring cargo to an unauthorized carrier vessel.
47. **COM07 agreed not to include these Japan-nominated vessels (Vessel numbers 13, 14 and 15 from the NPFC Provisional IUU Vessel List) in the 2023 NPFC IUU Vessel List on the following conditions: the Chinese government will further investigate the case and take effective actions, such as, inter alia, prosecution or the imposition of sanctions of adequate severity. These three vessels must not be registered to the NPFC Vessel Registry and must not operate in the Convention Areas unless those sanctions have been fully complied with and Members are satisfied with the actions taken by the flag State. For this consideration, China will update the Members of the result of the investigation and relevant sanctions intersessionally and at TCC07.**
48. Japan also reported to COM07 on a carrier vessel, flagged to China, which denied HSBI by Japanese inspectors even though the inspectors were wearing personal protective equipment. For this case, Japan noted that it had received a positive response from China committing to a thorough investigation. The vessel has been de-registered, its license has been suspended for six months and it has received a stern warning to accept HSBI in future.
49. **COM07 agreed not to include this carrier vessel (Vessel number 20 from the Provisional IUU Vessel List) in the 2023 NPFC IUU Vessel List on the following conditions: the Chinese government will further investigate the case and take effective actions, such as, inter alia, prosecution or the imposition of sanctions of adequate severity. This vessel must not be registered to the NPFC Vessel Registry and must not operate in the Convention Areas unless those sanctions have been fully complied with and Members are satisfied with the actions taken by the flag State. For this consideration, China will update the Members of**

the result of the investigation and relevant sanctions intersessionally and at TCC07.

50. Japan reported on two further vessels, also flagged to China, which had been cited for a variety of offences including bunkering with an unregistered carrier.
- 51. COM07 agreed to not include these two fishing vessels in the 2023 NPFC IUU Vessel List, noting China's commitment to require its vessels to receive fuel from NPFC-registered tankers only.**
52. Having taken these decisions with regard to the Provisional IUU Vessel List, four vessels remained.
- 53. COM07 considered the Provisional IUU Vessel List recommended by TCC06 and agreed to add four vessels, i.e. Zhong Fu Hao 111, Gloriwave (currently named Riwa), Qian Yuan and Shun Hang to the IUU Vessel List for 2023 (AnnexM).**
- 54. Noting that TCC06 did not recommend any proposed changes to the NPFC 2021 IUU Vessel List, COM07 agreed to retain the 36 vessels on the existing list for a total of 40 vessels.**

6.3 Adoption of Final Compliance Monitoring Report (CMR)

55. The TCC Chair reported to COM07 that TCC6 extensively discussed, but did not adopt, the CMR for 2021.
- 56. COM07 agreed to task TCC with inter-sessional work on the CMS and CMR using the review of the draft CMR as captured in the TCC06 meeting report as a starting point.**
- 57. COM07 agreed that the CMM on CMS be extended for one year while the inter-sessional work on a revised CMM on CMS proceeds (Annex N).**
- 58. COM07 endorsed the list of 44 obligations assessed in the 2021 draft CMR, leaving open the possibility to add any obligations arising from new CMMs adopted by COM07 (Annex N).**
- 59. COM07 agreed that all CMM clauses containing the word "shall" should be assessed in the CMR with the Secretariat reporting back on a) any data gaps which prevent the assessment of these obligations, and b) any obligations that lack sufficient specificity for objective assessment.**

Agenda Item 7. Report of the 5th Finance and Administration Committee Meeting

7.1 Review of FAC05 Report

60. The FAC Chair presented COM07 with the report of FAC05 (**Annex O**), noting that due to the recent infrequency of FAC meetings, there were many backlogged issues needing to be cleared. Consensus was reached on several issues, including the Commission's Budget for 2023/2024, Budget Estimates for 2024/2025 and Indicative Budget Estimates for 2025/2026 and 2026/2027. FAC05 did not have time to discuss the issues of MOUs with WCPFC, SPRFMO and ISC and referred them to COM07. Furthermore, the issue concerning a repatriation allowance for the former Compliance Manager was referred to Heads of Delegation, and the issue of the NPFC Staff Selection Policy as outlined in NPFC-2023-FAC05-WP10 rev1 was left open for discussion by COM07.

61. COM07 accepted the report of FAC05 and recommendations.

62. The FAC05 Chair provided COM07 an update on the request from the former Compliance Manager. COM07 recognized the important contributions of the former Compliance Manager and considered that all commitments between the Commission and the former Compliance Manager have been fulfilled.

63. Noting the exceptional nature of the Commission's request to delay the timing of the former CM's repatriation, and without setting any precedent for future staff remuneration issues, COM07 agreed that the request to review his repatriation package resulting from exchange rate fluctuations relative to those applied to salaries in the NPFC be addressed through a payment from the 2022/23 budget as an extraordinary expense and that this is in line with his request to the FAC Chair and Heads of Delegation.

7.2 Adoption of the proposed budgets for 2023/2024 and 2024/2025 and Member Contributions

64. One Member requested clarification on whether the issue of the repatriation allowance for the former Compliance Manager might have implications for the budgets agreed by FAC05, i.e. require them to be revisited.

65. The Executive Secretary explained that these repatriation funds, if agreed by COM07, could be sourced from the current year's budget and thus not affect the budgets agreed by FAC05.

66. COM07 adopted the proposed budgets for 2023/24 and 2024/25 (Annex P) and associated Member Contributions for 2023/24 and 2024/25 (Annex Q).

Agenda Item 8. Report of the 1st, 2nd and 3rd Meetings of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

67. Dr. Toshihide Kitakado, the Co-Chair of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

presented a summary of work accomplished during three meetings of the SWG (February 2022 (**Annex R**), September 2022 (**Annex S**) and March 2023 (**Annex T**); NPFC-2023-COM07-IP05). The SWG MSE PS Chair explained the management strategy evaluation (MSE) as an evaluation process of candidate management procedures for achieving stated management objectives through stochastic simulations. Prior to describing the SWG-related reports, the SWG MSE PS Chair noted the current stock status as follows: a) catches of Pacific saury are at an historical low in 2021 and 2022; b) an increasingly higher proportion of catch is being taken from the Convention Area ; c) the stock declined from high productivity status in mid-2000s to the current low levels; d) fishing pressure has been high compared to F_{msy} level for more than 10 years; e) although there was a slight increase in biomass from 2021 to 2022, recent stock biomass remains at an historically low level in recent years. The SWG MSE PS Chair also stressed the scientific advice from SSC PS and SC as follows: i) the current total allowable catch (TAC) specified in CMM 2021-08 is much larger than a TAC based on an F_{msy} catch approach; and ii) a simplified but commonly used approach in other RFMOs to harvest control rules (HCR) suggests that current catch levels are similar to what an HCR would recommend. The SWG MSE PS Chair further explained the main agreements in the SWG meetings. The SWG MSE PS Chair noted it had been decided that the primary management objective is stock recovery, with secondary objectives of avoiding an unsustainable stock status and achieving high and stable catches. Among three options for operating models, the current interim stock assessment (BSSPM) has been selected, noting, however, that this model cannot account for environmental effects and is relatively optimistic about stock recovery. Three HCRs are being examined: one is a typical HCR with a one-year time lag between the assessment and implementation, and the others incorporate a fishery-independent survey conducted by Japan just before the main fishing season for adjusting a preliminary TAC if changes in biomass (or its index) exceed a predetermined trigger level. The SWG anticipates selection of an HCR in 2024 that can be used to set the Pacific saury TAC at COM08.

68. Japan reiterated its concern about the status of Pacific saury stocks and the need for MSE work to continue as a basis for informed management decision-making.
69. In response to a question, the SWG MSE PS Chair explained in more detail how the survey-adjusted candidate HCRs could be used. First a preliminary and precautionary TAC would be set based on the assessment conducted in the previous year and if the results of the fishery-independent survey index meet a trigger level, the TAC would be adjusted just before the main fishing season. For example, if the index doubled, this would be taken as a sign of recovery and the TAC could be

adjusted upward. In contrast, if the index only increases by 10-20% then the TAC would remain as it is. Such trigger levels and the extent of adjustment are still being considered by the SWG MSE PS.

70. One Member expressed concern about HCRs that could change the TAC on short notice as this could present practical problems for domestic managers administrating the TAC as well as socio-economic issues for the fishery.
71. The Chair of the SWG MSE PS noted the concern for future consideration by the SWG MSE PS. However, he considers that dynamic HCRs (i.e. those that involve adjustment through the fishery-independent survey) may have a higher probability of achieving the agreed management objective of recovering the stock.
72. One Member appreciated the valuable information contained in the SWG MSE PS Chair's presentation and asked that it be posted as an Information Paper (NPFC-2023-COM07-IP05).
73. One Member reserved its position with regard to the three candidate HCRs, noting that it might wish to consider other candidate HCRs in future.
- 74. COM07 accepted the reports and recommendations from the SWG MSE PS and thanked the SWG for its work.**

Agenda Item 9. Conservation and Management Measures

9.1 *Review of the Amendments to Existing CMMs and any new CMMs*

9.2 *Chub mackerel (Secretariat note: CMM chub mackerel updates are identified in para. 105)*

75. The European Union introduced its proposal to amend the chub mackerel CMM (2019-07) to allow the EU participating in this fishery, and giving effectively full effect to the EU's membership in NPFC (NPFC-2023-COM07-WP03 rev1). The EU also introduced its Fisheries Operation Plan containing an impact assessment for its proposed chub mackerel fishery (NPFC-2023-COM07-WP04 rev1). The EU noted that the proposed modest annual allocation (20,000t) represented only ~5% of the total annual catch of this species in the Convention Area. The EU further noted that to date no scientific, technical or compliance concerns have been raised with regard to the proposal by TCC or SC.
76. Some Members expressed concerns about the potential for operational conflicts with other fisheries in the area.
77. One Member considered that the proposal to catch such a large amount of chub mackerel in a short period of time might pose unacceptable risks to the ecosystem.
78. One Member, citing Article 3(h) of the Convention text, expressed concern with expanding fishing effort in the absence of scientific advice from the SC. It

suggested that the proposal be limited to one year as a trial, subject to review by SC08, TCC07 and COM08. It further stated this fishery should not be a basis for future decisions that refer to a historical catch in the Convention Area noting that in SPRFMO an “interest to fish” is considered to be 0.1% of the historical catch.

79. The EU noted that it had already committed to a clear catch limit, and its proposal would contribute useful scientific information on chub mackerel and other species to the Commission. The EU maintained that it should not be held to different standards than those applied to the Members fishing the other 95% of the catch.

80. The EU made the following statement:

“The EU expressed its disappointment with the position taken by the NPFC Members fishing for chub mackerel on the EU proposal. It reminded that since 2018 the EU has developed a thorough and comprehensive Fisheries Operation Plan, using the best available science. The EU also reminded that none of the Members was requested or developed such a detailed Fisheries Operation Plan for any of the current fishing operations taking in place in the Convention area. According to the EU, the last scientific information available presents a stock that has been recovering during the last years and currently it seems to be in the green quadrant of the KOBE plot, which means that it is at a healthy status. The EU stressed that the SC has not raised any concern on the status of the chub mackerel stock. The EU indicated that it had presented a proposal aiming at taking into account a range of conditions suggested to the EU by some Members. The EU noted that these conditions have not been imposed to any other Members and that in its view, they did not have any scientific basis, therefore the EU considered many of those conditions discriminatory and against the spirit and principles of UNCLOS and UNFSA. The EU urged the Commission to finalize the stock assessment of chub mackerel, a task that has been unresolved for already too many years and offered to support the Commission in finalising this important task (including through voluntary financial contributions if this could facilitate this process). The EU reiterated its concerns expressed at TCC, that while the EU is refused repeatedly access to the chub mackerel fishery, some members appear to be in breach with the key obligation under CMM2019-07 which requires to avoid increasing fishing effort for this stock. The EU indicated that this was clearly documented on figures 7 and 9 of the IP01 presented at TCC6. The EU urged these members to refrain from expanding their fishing effort for chub mackerel and to comply with the obligations of the CMM 2019-07. The EU indicated that it will

continue to work intersessionally with Members in a constructive spirit to make sure that next year, a compromise would be reached that would allow the EU to participate and operate in NPFC fisheries on an equal footing as other Members.”.

81. Some Members stated that they had supported the EU proposal and need for additional scientific advice, and also shared the EU concern that some Members may not be complying with the effort limits in the current measure. While they encouraged Members to consider the EU proposal and seek a consensus outcome in future years, they did not share the EU’s view that the lack of adoption of their proposal should be considered discriminatory treatment.
82. One Member stated that its fishing effort was kept within historical existing levels in accordance with CMM 2019-07 and it is willing to work with Members to maintain the sustainability of the stock.

9.3 *Pacific Saury*

9.3.1 *Pacific Saury Proposal by Japan*

83. Japan introduced its proposal for updating paras. 4, 5 and 6 of the current CMM for Pacific Saury (2021-08) covering TAC setting, catch limits for Members and seasonal closures (NPFC-2023-COM07-WP-05). Japan noted the need for revised allocations for Pacific saury and the serious situation that has developed in conjunction with increasingly intensive fishing on the high seas. Three factors were cited as contributing to this: a) the high seas fishing season has become longer; b) the use of technological advances such as high-performance sonar systems and aggregating lights; and c) high incidence of transshipment. As a result, fewer Pacific saury are migrating to coastal areas and this has had a devastating effect on local communities which rely on this stock. Japan proposes to reduce fishing mortality linearly when biomass is below B_{msy} . The proposal calls for a TAC of 101,000t in the Convention Area (as compared to a total catch of 170,000t over the entire range of the stock). The proposal also calls for a fishery closure from January to July, allowing the fishery to open in August when the fish are more mature, and due to higher fat content, have a higher market value. This is considered a more efficient use of limited resources.
84. One Member acknowledged the importance of the resource to local communities and supported the proposal.
85. Some Members considered the proposed TAC was too low. These Members also expressed concern that the proposed seasonal closure is too long and too burdensome on the fishing industry, particularly with regard to crewing contracts.

86. One Member called for a simulation study of the closure period to determine the optimal length of closure.
87. Japan noted that the seasonal closure is one way of reducing fishing effort and other ways could be considered.
88. An Observer supported the proposal by Japan and encouraged adoption of a HCR for Pacific saury in 2024.

9.3.2 *Pacific Saury Proposal by Korea*

89. Korea presented its proposal to update paras. 4, 5 and 6 in CMM 2021-08 Pacific saury (NPFC-2023-COM07- WP08 rev1). The proposal calls for a) a TAC in 2023 and 2024 of 205,000t; b) a reduction in catch by Members of 55% from the 2018 level unless Members have already complied with para. 14 of the existing measure, in which case a catch reduction of 45% would apply; and c) prohibition of fishing for Pacific saury in the areas east of 170°E from June to July as a means of protecting juvenile fish.
90. Vanuatu called upon the Commission to take into account the development aspirations of small island developing States (SIDS). In addition, Vanuatu was of the view that while the current stock is comparable to previous years, the biomass level likely recovered in 2021 and 2022, and Vanuatu will not oppose a more stringent measure as long as Members considered the special requirements of small island developing States.
91. One Member noted that distant water flag States must take full responsibility for their flagged vessels operating in the Convention Area.
92. One Member noted that the measure will not affect the management situation in domestic waters.
93. Some Members expressed concern that since para. 14 of the existing CMM is a voluntary provision, it should not be used as the basis for preferential treatment for those Members which voluntarily complied with it.
94. In discussions at COM07, this proposal was combined with the proposal for Pacific saury discussed under Agenda Item 9.3.

9.3.3 *Combined Proposal*

95. After further discussions in the margins of COM07 incorporating the discussions under Agenda Item 9.5, a revised proposal was produced (NPFC-2023-COM07- WP05 rev4) which provides Members with two options for effort control: a) reduce the number of vessels fishing for Pacific saury by 10% from 2018 levels; or b) limit fishing days to 180 days. Each Member can choose and notify the Secretariat of

their preferred option. Members which had fewer than five vessels in 2018 are exempt from these effort controls. A TAC of 150,000t would be authorized in the Convention Area for 2023 and 2024 compared to a total catch of 250,000t for the Pacific. The seasonal closure provision is mandatory and requires no fishing east of 170°E in June and July.

96. Canada expressed its disappointment that a more sustainable approach to managing Pacific saury had not been adopted at COM07, but in the absence of any opportunity for a better measure, stated that it was prepared to accept the proposal.
97. United States also expressed disappointment as it had anticipated setting a more precautionary TAC. However, this Member considered the effort control aspects of the proposed measure to be useful and it was prepared to support the proposal as progress towards more sustainable management, and on the understanding that the TAC can be revisited once the scientific advice on the stock is updated.
98. Vanuatu, referring to its special status as a small island developing state and as the smallest player in the Commission, urged the Commission to consider its aspirations under international instruments and NPFC Pacific saury CMM in future meetings.
99. One Member expressed its continuing concern about the Pacific saury stock which is in a depleted state due to fishing activities in high seas areas. This Member looks forward to better management of the stock in the future.

100.COM07 adopted an amended CMM for Pacific saury (Annex U).

9.4 Reporting requirements for Japanese sardine, neon flying squid and Japanese flying squid, and chub mackerel

101. Korea introduced its proposal (NPFC-2023-COM07-WP06 rev1) to add language to CMM 2021-11 requiring the recording and reporting Japanese sardine, neon flying squid, and Japanese flying squid in accordance with domestic recording and reporting requirements. Korea considered that these requirements could usefully be extended to include Pacific saury and chub mackerel as well.
102. Some Members supported the proposal with the inclusion of Pacific saury and chub mackerel.
103. The EU suggested that the reporting of effort data also be included, since it was a very basic and important reporting requirement in all RFMOs.
104. Korea agreed to further amend the proposal, including updates for Pacific saury and chub mackerel, with a view to adoption by COM07.
- 105.COM07 adopted the following language for insertion into CMMs on Japanese sardine, neon flying squid and Japanese flying squid (Annex V), Pacific saury (Annex U), and chub mackerel (Annex W): “Members of the Commission and CNCPs shall ensure that fishing vessels flying their flag that fish for [*<insert***

species>] record their catches and report them to the relevant flag State authorities in accordance with their national data recording and reporting requirements”.

9.5 *Amendment to vessel registry*

106.China introduced its proposal to allow non-Members of NPFC to register tanker vessels on the NFPC vessel registry, noting that the proposal was discussed at TCC6 (NPFC-2023-TCC06-WP06 rev1).

107.China reported that there was no consensus on the proposal. China expressed its hope that the Commission will take up this issue in future discussions.

9.6 *COVID HSBI guidelines*

108.Canada introduced a proposal to update the COVID-19 guidance for HSBI in line with current understanding and practice (NPFC-2023-TCC06-WP07 rev2). Canada noted that this proposed non-binding recommendation supercedes all previous HSBI COVID-19 guidelines and has incorporated minor edits in response to comments received since TCC06.

109.COM07 adopted the revised NPFC High Seas Boarding and Inspection COVID-19 Recommendation (Annex X).

9.7 *Sharks*

110.Canada presented its proposed CMM to protect sharks in the Convention Area by prohibiting the retention of shark or shark parts and encouraging reporting obligations for incidental encounters and releases (NPFC-2023-COM07-WP08 rev3). USA co-sponsored the proposal. The text was clarified and amended to address concerns articulated by Members.

111.Some Members questioned whether the NPFC is competent to regulate, and in this case, prohibit directed fishing for sharks.

112.One Member considered that simply having shark fins onboard was not an indication of a directed shark fishery and that the amount of shark catch should be considered.

113.One Member expressed concern that the scope of the measure is too broad given that many NPFC fisheries do not normally have shark interactions.

114.Other Members stated that even though WCPFC has the mandate for some shark species in the NPFC Convention Area, it is still NPFC’s responsibility to manage bycatch in the fisheries for which it is responsible. Furthermore, the measure is limited to those vessels included in the NFPC vessel registry and not otherwise registered to other RMFOs. These Members noted multiple incidents of shark fins

being identified onboard during NPFC HSBIs which suggests that a) there are shark interactions in NPFC fisheries and b) the practice may be widespread and needs to be banned immediately.

115. One Member suggested that the safe handling and release guidelines are based on longline fisheries and these guidelines don't align well with the types of gear used in the NPFC.

116. Some Members considered that proposals such as this should originate from the SC so they have scientific review before they reach the Commission for decision.

117. Some Members highlighted the importance of gathering useful data on shark interactions through the imposition of logbook recording and reporting requirements in the measure.

118. The Commission Vice-Chair suggested a way forward involving paring down the text to just two elements: a) a ban on shark finning; and b) a statement by the Commission that there are currently no directed shark fisheries therefore under Article 3(h) of the Convention any future directed fisheries would require an impact assessment of the long-term sustainability of any such fisheries should they occur.

119. One Member stated that it could accept recording and reporting requirements for retained sharks only.

120. Canada revised the proposal to reflect a ban on shark finning and a statement by the Commission that as there are currently no directed shark fisheries, any expansion of fishing effort must follow the process in Article 3(h) of the Convention.

121. Members discussed the shark interaction reporting requirements and agreed sharks should be reported by species where possible. Other minor adjustments were made to the text for clarity (NPFC-2023-COM07-WP08 rev5).

122.COM07 adopted a CMM on sharks (Annex Y).

9.8 *Pollution prevention*

123. Canada introduced its proposal to adopt a CMM to reduce marine pollution in the Convention Area (NPFC-2023-TCC06-WP09 rev3). Based on feedback from TCC06 and discussions in the margins of COM07, Canada noted that it had amended the proposal to better align with WCPFC and SPRFMO pollution measures.

124.COM07 adopted a CMM on pollution prevention (Annex Z).

9.9 *Transshipment*

125. COM07 discussed a draft of a CMM on transshipment and other transfer activities produced by TCC06 and amended the draft measure through a series of SWG meetings chaired by Amber Lindstedt (Canada) and held in the margins of COM07.

126.COM07 adopted an amended CMM on transshipment (Annex AA).

127.COM07 confirmed that violation of obligations contained in the CMM on transshipment would be considered in accordance with CMM 2019-02 “Conservation and Management Measure to Establish a List of Vessels Presumed to have carried out IUU Fishing Activities in the Convention Area of the NPFC”.

128.Canada announced that it will make a voluntary contribution of US\$40,000 for the Secretariat toward the development of the necessary applications for the Secretariat to effectively implement the reporting requirement functions in the transshipment measure that the Commission adopted.

9.10 HSBI Report Form

129.Japan presented a proposal to modify the format of the reports used to record the results of high seas boarding and inspections (NPFC-2023-TCC06-WP13 rev1).

130.COM07 adopted the amended format of the HSBI Boarding Inspection Report Form for inclusion in Annex C of the NPFC HSBI Implementation Plan (Annex BB).

9.11 Revision to VMS requirements for research vessels and manual reporting of course and speed

131.Japan introduced its proposal to exempt research vessels from mandatory VMS reporting by requiring them to report via AIS, and remove requirements to provide course and speed for all vessels when manually reporting (NPFC-2023-TCC06-WP14 rev 1). The AIS requirement would take the form of a new paragraph added to the VMS CMM (2021-12). The change to the requirement to provide course and speed would result in an amendment to para. 1(h) of the existing measure.

132.One Member considered that additional language should be added to cover requirements in the event of AIS malfunction.

133.Some Members suggested that the exemption for research vessels be implemented on a one-year trial basis and the results reviewed at TCC07.

134.Japan revised the proposal to reflect the proposed one-year trial period and a requirement for research vessels to notify authorities 30 days prior to initiating their cruises (NPFC-2023-TCC06-WP14 rev 2).

135.COM07 adopted an amended VMS CMM as it pertains to research vessels and the requirements to report course and speed when manually reporting (Annex CC).

9.12 Proposal to temporarily suspend transshipment

136. Japan introduced its proposal to adopt a temporary ban on transshipment at sea unless COM07 adopts a new CMM on transshipment (NPFC-2023-TCC06-WP15 rev1) which the United States is co-sponsoring. Japan clarified that the objective of the proposal is not to prevent transshipment but to ensure that all transshipment is effectively controlled and managed. It queried how, under current circumstances, flag States can effectively monitor the catch of their vessels and control the risk of IUU fishing.
137. Some Members did not support the proposed ban on the basis that it would cause onerous impacts to their fisheries.
138. Some Members considered that the effects of the measure would be to ban transshipment by legally operating vessels while allowing it to continue for those vessels operating illegally.
139. Japan withdrew its proposal on the basis of the adoption of the transshipment CMM (see Agenda Item 9.9).

9.13 *VMS Tampering and Serious Violations*

140. Korea introduced its proposal to revise the VMS CMM (2021-12) to require MTUs to be tamper-proof and clarify that it is a serious violation to intentionally tamper with or disable a VMS unit (NPFC-2023-TCC06-WP16 rev2). The proposal was further amended to replace “must” with “shall” (NPFC-2023-TCC06-WP16 rev3).
- 141. COM07 adopted an amended VMS CMM by adding a new paragraph (after para. 15 of the existing measure) which states “MTUs on fishing vessels shall be tamper-proof so as to preserve the security and integrity of VMS data.” (Annex CC).**

9.14 *Climate change*

142. The United States introduced a resolution on climate change (NPFC-2023-TCC06-WP27 rev2). Canada, the EU and Korea co-sponsored the proposal. The resolution calls for making the topic a standing item of the Commission and relevant subsidiary bodies which should make recommendations to help adapt to climate change and promote resilience in NPFC fisheries. The United States noted that format and wording of the proposal has been modified in response to Members’ comments received in the margins of COM07.
- 143. COM07 adopted a Resolution on climate change (Annex DD).**

9.15 *Bottom Fishing CMMs*

144. COM07 considered the recommendations of SC07 regarding amendments to CMM

2021-05 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean and CMM 2019-06 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean. These amendments pertained to encounter thresholds for cold water corals and sponges, move-on rules, encounter reporting requirements, provisions for closures, and revision of text regarding catch limits for North Pacific armorhead and development of new fisheries for North Pacific armorhead and splendid alfonsino (CMM 2021-05 only).

145. In response to a question about how the move-on distance of 2NM was reduced to 1NM, the SC Chair explained that Deep Sea Conservation Coalition and SPRFMO data on VME patch sizes had been reviewed by the SC and it was determined that VME patch size was small enough that 1NM is sufficient.
146. In response to another question about the 500kg threshold for sponges, the SC Chair agreed that the threshold value is large and will be reviewed relative to other RFMO's thresholds by taxa and by gear type.
147. Canada, the EU and the United States considered that a 500kg threshold for sponges is tantamount to not setting a threshold at all. These Members referred to the SPRFMO threshold for the same taxa set at 25kg and emphasized the need to apply the precautionary approach.
148. One Member did not support the specification of any encounter threshold that had not been reviewed by the NPFC SC.
149. An Observer noting that the UN's second World Ocean's Assessment stated that bottom trawling is the greatest current threat to seamount ecosystems, urged the Commission to deliver on its commitment to protect VMEs by closing areas to fishing. This Observer referred to a recent groundswell of support for biodiversity protection signified by UNGA Resolution 77-118, the Kunming-Montreal Global Biodiversity Framework and negotiation of the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ). He also noted that deep sea sharks are amongst the most vulnerable of shark taxa.
- 150. COM07 adopted amended CMMs based on the recommendations of the SC, but tasked SC08 with reporting back to COM08 regarding the appropriateness of the 500kg encounter threshold for sponges based on a review by taxa, gear type and the use of encounter thresholds in other RFMOs (Annexes EE and FF).**

Agenda Item 10. NPFC Data Sharing and Data Security Protocols

151. The TCC Chair introduced work by TCC06 on the NPFC Data Sharing and Data Security Protocol (for data other than VMS) (NPFC-2023-TCC06-WP25 rev3).

Discussions have continued in the margins of COM07.

152. Members discussed para. 28, as proposed by one Member in TCC06, and agreed to delete it.

153. Members discussed whether in Annex 2(j), data in Section 2 of the Annual Report to the Commission by Members should remain as confidential data or whether this requirement could be relaxed.

154. One Member which preferred to keep Section 2 data confidential, stated it is working toward placing Annual Report-Section 2 data in the public domain and hoped to revisit this issue in future.

155.COM07 adopted the NPFC Data Sharing and Data Security Protocol (Annex GG).

Agenda Item 11. Cooperation with Other Organizations

11.1 NPAFC

156. The Science Manager presented NPFC-2023-TCC06-WP23 rev2 containing a draft Work Plan to implement the Memorandum of Cooperation (MOC) between NPFC and the North Pacific Anadromous Fish Commission (NPAFC).

157. One Member expressed concern regarding the exchange of bycatch data on Pacific salmon, particularly as the NPFC has no mechanism to collect such data, as well as the financial implications that might arise from the MOC.

158. Dr Vladimir Radchenko (NPAFC) explained that no financial obligations are imposed through the MOC and considered that the exchange of information on salmon bycatch in NPFC fisheries would be very useful for both organizations. NPAFC would like to consider adopting the MOC at its next meeting in May 2023.

159. One Member referred to an agreement at TCC04 which provides for voluntary reporting of salmon encounters for NPFC fisheries. This Member suggested that the Pacific salmon bycatch data exchange under the MOC could be done on a voluntary basis.

160.COM07 approved the Work Plan with NPAFC on the basis that there are no associated financial obligations and that bycatch information would be provided voluntarily (Annex HH).

11.2 FAO FIRMS

161. The Science Manager presented NPFC-2023-COM07-WP13 describing collaborative and partnership agreements with FAO's Fisheries and Resources Monitoring System (FIRMS). The overall goal of participating in FIRMS is to

allow decision-makers access to information, such as fisheries status and trends, to develop effective policies.

162.Mr Aureliano Gentile (FAO) explained that a partnership agreement carries no cost implications aside from occasional travel to steering committee meetings. Partners have a vote in FIRMS decision-making and thus can drive products that are of interest to them. Collaborative agreements are designed for research and academic organizations.

163.COM07 agreed to enter into a partnership agreement with the FAO FIRMS (Annex II).

11.3 WCPFC

164.The Executive Secretary summarized the progress toward a Memorandum of Understanding (MOU) with the Western and Central Pacific Fisheries Commission (NPFC-2023-TCC05-WP18). This draft of the MOU was shared with the WCPFC Executive Director (at the time, Mr. Feleti Teo), and has undergone an initial legal review in WCPFC, but would now need to be shared formally with the new WCPFC Executive Director.

165.COM07 adopted the text of the MOU with WCPFC and tasked the Executive Secretary with coordinating the execution of the MOU with the WCPFC Executive Director (Annex JJ).

11.4 SPRFMO

166.The Executive Secretary summarized the status of the draft MOU with the South Pacific Regional Fisheries Management Organization (SPRFMO) (NPFC-2023-FAC05-WP07). He noted that the wording of this MOU is drawn from the draft MOU with WCPFC and had been earlier circulated to Members at COM06. There has been some discussion of this MOU with SPRFMO in the past, but if this draft is endorsed by COM07, the Executive Secretary will provide the updated text to the SPRFMO Executive Secretary for his review.

167.The draft MOU text was further revised through discussion with Members at COM07 who requested some clarification of language and content (NPFC-2023-FAC05-WP07 rev 3).

168.COM07 adopted the text of the MOU with SPRFMO and tasked the Executive Secretary with coordinating the execution of the MOU with the SPRFMO Executive Secretary (Annex KK).

11.5 IMCS Network – NPFC-2023-COM07-WP07

169.The Executive Secretary reminded COM07 of an invitation by the IMCS network for NPFC to formally join the organization (NPFC-2023-TCC06-WP21).

170.Ms. Sarah Lenel (IMCS Network) explained that the network is an informal voluntary organization, focused on cooperation and information exchange. It was established in 2001 and currently has over 80 members. The IMCS Network coordinates the Tuna Compliance Network, which allows compliance managers and Chairs and Co-Chairs of relevant bodies to share lessons learned. Ms. Lenel noted that the level of participation in the IMCS Network is left to the organization to decide and there are no financial obligations imposed.

171.COM07 agreed to become a member of the IMCS Network.

11.6 *ISC*

172.The Executive Secretary noted that a draft MOU with the International Scientific Committee (ISC) had been presented to FAC05 as NPFC-2023-FAC05-WP12. Due to time constraints FAC05 did not make any recommendations regarding this draft MOU.

173.COM07 adopted the text of the MOU with ISC and tasked the Executive Secretary with discussing its development with the ISC Chair (Annex LL).

Agenda Item 12. Other Matters

12.1 *Selection of the Commission Chair and Vice Chair*

174.Mr. Shingo Ota (Japan) was nominated as Commission Chair. Ms. Jung-re Riley Kim (Korea) was nominated as Commission Vice-Chair.

175.COM07 selected Mr. Shingo Ota (Japan) and Ms. Jung-re Riley Kim (Korea) as Chair and Vice-Chair of the Commission, respectively, for a two-year term beginning at the conclusion of COM07.

12.2 *Selection of Chairs and Co-Chairs of Subsidiary Bodies*

176.COM07 confirmed the TCC06 nominations of Ms. Alisha Falberg (United States) as Chair and Ms. Amber Lindstedt (Canada) as Vice Chair of TCC for a two-year term.

177.COM07 confirmed the FAC05 nominations of Mr. Dan Hull (United States) as Chair and Mr. Luoliang Xu (China) as Vice-Chair of the FAC for a further two-year term.

178.COM07 confirmed Mr. Derek Mahoney (Canada) as the Co-chair representing TCC for the Small Working Group on Management Strategy Evaluation for

Pacific saury.

12.3 Confirmation of Secondments and Interns

179.COM07 confirmed FAC05's recommendation of a one-year extension of the secondment of Ms. Natsuki Hosokawa from the Fisheries Agency of Japan to NPFC and the appointment of Mr. Jihwan Kim (Korea) to a 6-month internship.

12.4 Transparency of the Commission

180.The Executive Secretary explained that there are two aspects to this agenda item. First, NPFC-2023-FAC05/TCC06-WP03 discusses updates to the document rules to reflect changes to data accessibility via the website/collaboration site. FAC05 endorsed the approach outlined by the paper; TCC06 also considered the paper but did not make a recommendation.

181.COM07 adopted the revision to the NPFC Document Rules (Annex MM).

182.Some Members indicated they are interested in seeing documents made available to the public more broadly and would work intersessionally with the Secretariat on proposed language.

183.Second, NPFC-2023-TCC06-WP10 presented a proposal to TCC06 by the SWG-PD covering rules for observer access to TCC SWG meetings, public access to all meeting documents, and observer access to compliance reports. TCC06 could not reach consensus on these proposals. Discussions continued at COM07 resulting in a revised proposal (NPFC-2023-TCC06-WP10 rev1) for Rules of Transparency Pertinent to TCC to be implemented on an interim basis for a one-year period.

184.Some Members maintained that such an interim policy should not be required as the TCC SWG meetings should be open as a default practice consistent with the NPFC Rules of Procedure. Nevertheless, these Members considered that the policy represents a positive step forward from recent practices and were prepared to accept it.

185.COM07 adopted the Interim NPFC Rules of Transparency Pertinent to TCC for a one-year period through TCC07 (Annex NN).

12.5 Staff Selection Rules

186.The FAC Chair provided some background to the issue of the staff selection policy (NPFC-2023-FAC05-WP10). The paper contains two parts, and the latter part— Staff annual review of performance— was agreed by FAC05 and endorsed by

COM07 when it endorsed the report of FAC05. The first part of the paper deals with staff selection policy. This part has been the subject of ongoing discussion in the margins of COM07.

187.While there was no consensus to adopt the first four pages of the document as a whole, Members did agree to adopt one section of the text in NPFC-2023-FAC05-WP10 rev2.

188.COM07 adopted the paragraphs contained under “Appointment terms(s)” as a revised NPFC staff selection policy (Annex OO).

12.6 Press Release

189.COM07 endorsed the Press Release for publication on the NPFC website.

Agenda Item 13. Date and Place of Next Meeting

190.COM07 confirmed tentative dates for TCC07 as 9-12 April 2024, for FAC06 as 13 April 2024 and for COM08 as 15-18 April 2024 in Japan, with a priority on Tokyo/Yokohama area, taking into account price and availability.

Agenda Item 14. Adoption of the Report

191.The report was adopted by consensus.

Agenda Item 15. Close of the Meeting

192.COM07 closed at 23:12 on 24 March 2023.

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- Annex B – Agenda
- Annex C – List of Documents
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- Annex E – Statement from the European Union
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- Annex G – Report of the North Pacific Fisheries Commission Performance Review Panel
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- Annex U – CMM 2023-08 for Pacific Saury
- Annex V – CMM 2023-11 for Japanese Sardine, Neon Flying Squid and Japanese Flying Squid
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- Annex EE – CMM 2023-05 for Bottom Fisheries and Protection of VMEs in the NW Pacific

Ocean

Annex FF – CMM 2023-06 for Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean

Annex GG – NPFC Data Sharing and Data Security Protocols

Annex HH – Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

Annex II – FIRMS arrangement

Annex JJ – MOU WCPFC

Annex KK – MOU SPRFMO

Annex LL – MOU ISC

Annex MM – NPFC Document Policy

Annex NN – Interim rules of transparency pertinent to TCC

Annex OO – NPFC Staff Selection Policy

Annex A: Opening remarks from host Japan

Remarks provided by Mr Kondo, Director General, Fisheries Bureau, Hokkaido Prefecture

Good morning. I would like to say a few words of greetings in opening the 7th North Pacific Fisheries Commission meeting.

First of all, congratulations for having the Commission meeting in person after three and a half years, and I am very pleased to welcome everyone here in Sapporo, Hokkaido, for the first time in six years. Welcome to those who are here in person and thank you to those who are participating remotely, despite the time difference.

As you are all aware, the NPFC was established in 2015, and this is the 7th meeting of the Commission. Up to today, NPFC has been making efforts to contribute to the sustainable use of resources in the high seas of the North Pacific Ocean.

To cite a few examples:

- For Pacific saury, a TAC was introduced and for chub mackerel, neon flying squid, bottom fish and others, stock management measures have been implemented.
- Other actions include the development of IUU fishing vessel list, implementation of high seas boarding and inspections, and the start of regional vessel monitoring system.

On the other hand, some of these resource management measures are not necessarily sufficient from the perspective of sustainable use of resources.

Especially for Pacific saury, the resource status has remained at a historically low level over the past few years, and both the resource and the fishery are in a critical situation.

Pacific saury has been popular throughout Japan for a long time, and is a fish that represents the taste of autumn in Japan. It is a very important resource not only for fishing, but also for local cities that rely on the fishery industry, including related distribution and processing.

And here in Hokkaido we are famous nationwide as a major production area.

However, while the high seas fishery has developed rapidly, the number of fish in Japan's coastal areas has decreased significantly. Many Japanese people, not just distributors, are strongly concerned about the depletion of Pacific saury resources.

We believe that now is the time for all NPFC members to work together to significantly strengthen resource management measures in order to ensure the sustainable use of Pacific saury resources into the future. I hope that serious discussions will be held to strengthen the resource management of Pacific saury based on scientific evidence.

In addition, although this meeting is scheduled for three days, discussions will be held not only on Pacific saury, but also on various issues, and it is hoped that the sustainable use of fishery resources in the North Pacific high seas will be promoted. I am praying for you.

In closing, here in Hokkaido, the snow has completely melted in January, and fresh greenery is beginning to sprout. Unfortunately, the cherry blossoms are still more than a month away, but the season is the most pleasant and mild throughout the year.

I sincerely hope that your stay in Hokkaido will be a memorable and meaningful one.

**North Pacific Fisheries Commission
7th Commission Meeting
22-24 March 2023
Sapporo, Japan**

Agenda

1. Opening of the Meeting
 - a. Welcome Address
 - b. Appointment of Rapporteur
 - c. Adoption of Agenda
 - d. Meeting Arrangements
2. Membership of the Commission
 - a. Status of the Membership
 - b. CNCP status of Panama and other applications
3. Report from the Secretariat
4. Performance Review of the Commission
5. Report of the 6th and 7th Scientific Committee meeting
6. Report of the 6th Technical and Compliance Committee meeting
 - a. Review of TCC Report
 - b. Adoption of IUU Vessel List for 2023
 - c. Adoption of Final Compliance Monitoring Report
 - d. Consideration of other TCC issues identified during TCC05 or by COM07 meeting
7. Report of the 5th Finance and Administration Committee meeting
 - a. Review of FAC Report
 - b. Adoption of the proposed budget for 2023/2024 and 2024/2025
8. Report of the 1st, 2nd and 3rd Meetings of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)
9. Conservation and Management Measures
 - a. Review of the amendments to existing CMM's and any new CMMs

- b. Updated EU fishing plan for chub mackerel

10. NPFC Data Sharing and Data Security Protocols

11. Cooperation with Other Organizations

- a. PICES
- b. NPAFC
- c. FAO: ABNJ, FIRMS
- d. WCPFC
- e. SPRFMO
- f. UN BBNJ
- g. IMCS Network - NPFC-2023-COM07-WP07
- h. Other Organizations

12. Other matters

- a. Selection of the Commission Chair and Vice Chair
- b. Selection of the TCC Chair and Vice Chair
- c. Secondment and Intern for 2023
- d. Transparency of the Commission
Other business
- e. Press Release

13. Date and Place of next meeting of the Commission and its Committees

14. Adoption of the report

15. Close of the Meeting

LIST OF DOCUMENTS

MEETING INFORMATION PAPERS

Symbol	Title
NPFC-2023-COM07/TCC06/FAC05-MIP01	Meeting Information Paper and Hotel Request Form
NPFC-2023-COM07-MIP02	Provisional Agenda
NPFC-2023-COM07-MIP03 rev6	Annotated Indicative Provisional Agenda
NPFC-2023-COM07-MIP04 rev1	Recap (CMM Update) 23rd March

REFERENCE DOCUMENTS

Symbol	Title
NPFC-2023-FAC05-WP01 rev2	Secretariat – Commission Budgets 2023/2024 to 2026/2027
NPFC-2023-FAC05-WP04	Secretariat - NPFC Intern and Secondment program
NPFC-2023-FAC05-WP07 rev3	Secretariat - MOU with SPRFMO
NPFC-2023-FAC05-WP08	Secretariat - Consideration of the Performance Review
NPFC-2023-FAC05-WP10 rev2	Revision to NPFC Staff Selection Policy and Individual Performance Review
NPFC-2023-TCC06-WP06	China – Conservation and Management Measure on Information Requirements for Vessel Registration (CMM 2021-01)
NPFC-2023-TCC06-WP07 rev2	Canada - Update to NPFC High Seas Boarding and Inspection Covid-19 Guidelines
NPFC-2023-TCC06-WP08 rev4	Canada - Consideration for the Development of a Measure to Protect Shark Species in the North Pacific Fisheries Commission Convention Area
NPFC-2023-TCC06-WP08 rev5	Canada - Consideration for the Development of a Measure to Protect Shark Species in the North Pacific Fisheries Commission Convention Area
NPFC-2023-TCC06-WP09 rev3	Canada - Consideration for the Development of a Pollution Prevention Measure for the North Pacific Fisheries Commission Convention Area
NPFC-2023-TCC06-WP10 rev1	SWG PD - Interim NPFC Rules of Transparency Pertinent to TCC

Annex C: COM07 List of Documents

NPFC-2023-TCC06-WP12 rev7	SWG PD - Revisions to CMM 2016-03 on Transhipments and Other Transfer Activities
NPFC-2023-TCC06-WP13 rev1	Japan - Update to the NPFC High Seas Boarding and Inspection Report Form
NPFC-2023-TCC06-WP14 rev2	Japan - Proposal to amend the Vessel Monitoring Scheme CMM 2021-12
NPFC-2023-TCC06-WP15 rev1	Japan USA new CMM ban transhipment
NPFC-2023-TCC06-WP16 rev3	Proposal to amend CMM 2021-12 on the Vessel Monitoring System (VMS)
NPFC-2023-TCC05-WP18	Secretariat - TCC Considerations of Draft MOU with WCPFC
NPFC-2023-TCC06-WP21	IMCS Network – Invitation for NPFC to Join the International Monitoring Control and Surveillance Network
NPFC-2023-TCC06-WP23 rev2	Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation (MOC)
NPFC-2023-TCC06-WP25 rev3	SWG PD - NPFC Data Sharing and Data Security Protocol (data other than VMS)
NPFC-2023-TCC06-WP27 rev2	USA - CMM XX-2023 on Climate Change
Circular 2022-02	Panama’s December 2021 application for CNCP status

WORKING PAPERS

Symbol	Title
NPFC-2023-COM07-WP01	Secretariat - Cooperation with Other Organizations
NPFC-2023-COM07-WP02	Secretariat - NPFC Performance Review Report
NPFC-2023-COM07-WP03 rev1	EU chub mackerel CMM revision
NPFC-2023-COM07-WP04 rev1	EU chub mackerel operations plan
NPFC-2023-COM07-WP05 rev4	Japan Pacific saury CMM
NPFC-2023-COM07-WP06 rev1	Korea - Proposal to amend CMM 2021-11 for Japanese Sardine, Neon Flying Squid and Japanese Flying Squid
NPFC-2-23-COM07-WP07	Paper posted in TCC and removed from COM. Paper number not reused.
NPFC-2023-COM07-WP08 rev1	Korea - Proposal to amend CMM 2021-08 for Pacific saury
NPFC-2023-COM07-WP09 rev1	Panama - Application for Renewal of Cooperating NON-Contracting Party Status

Annex C: COM07 List of Documents

NPFC-2023-COM07-WP10	Secretariat - Location of Commission meetings
NPFC-2023-COM07-WP11	Revised CMM 2021-05 for bottom fisheries and protection of vulnerable marine ecosystems in the Northwestern Pacific Ocean
NPFC-2023-COM07-WP12	Revised CMM 2019-06 for bottom fisheries and protection of vulnerable marine ecosystems in the Northeastern Pacific Ocean
NPFC-2023-COM07-WP13	Collaborative Arrangement providing for international cooperation in the development and maintenance of the Fisheries and Resources Monitoring System between FAO and NPFC

INFORMATION PAPERS

Symbol	Title
NPFC-2023-COM07-IP01	Secretariat – Dates of Other meetings and the Lunar New Year in 2023/2024
NPFC-2023-COM07-IP02	Korea – Update from the NPFC Depositary
NPFC-2023-COM07-IP03	Secretariat - List of Chairs and appointment duration
NPFC-2023-COM07-IP04	Scientific Committee meeting reports
NPFC-2023-COM07-IP05	Report of the 1st, 2nd, and 3rd meetings of the SWG MSE PS
NPFC-2023-COM07-IP06	Draft Press Release
NPFC-2023-COM07-IP07	Panama Supporting Documentation

OBSERVER PAPERS

Symbol	Title
NPFC-2023-COM07-OP01	ANCORS GFW - Towards responsible transparency: understanding why fishers are cautious about sharing data
NPFC-2023-COM07-OP02	Statement to the 6th Meeting of the Technical and Compliance Committee and 7th Annual Session of the North Pacific Fisheries Commission Sapporo, Japan
NPFC-2023-COM07-OP03	Fishing through the Cracks: The Unregulated Nature of Global Squid Fisheries

SECRETARIAT REPORT

Symbol	Title
NPFC-2023-COM07-SR	Secretariat - Secretariat report to COM07

REPORTS

Symbol	Title
NPFC-2023-FAC05-Final Report	FAC05 Final Report
NPFC 2023 TCC06-Final Report	TCC06 Final Report
NPFC-2021-SC06-Final Report	Report of the 6th Scientific Committee
NPFC-2022-SC07-Final Report	Report of the 7th Scientific Committee
NPFC-2022-SWG MSE PS01-Final Report	Report of the 1st SWG MSE PS meeting
NPFC-2022-SWG MSE PS02-Final Report	Report of the 2nd SWG MSE PS meeting
NPFC-2023-SWG MSE PS03-Final Report	Report of the 3rd SWG MSE PS meeting
Report to Commission	NPFC Provisional IUU Vessel List
NPFC-2023-COM07-Final Report	COM07 Adopted Report in track changes

7th Commission Meeting
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Annex E: Statement by the European Union

Statement by the European Union

The EU delegation would like to thank the government of Japan for hosting this meeting in the beautiful city of Sapporo. We would also like to thank the secretariat for the organisation of the meeting.

The EU is pleased and honoured to participate for the first time as full member at a regular NPFC session.

The EU is committed to support and promote together with NPFC members, the conservation and management of fisheries resources, as well as the protection of biodiversity and marine ecosystems in the North Pacific.

Moreover, the EU will explore possibilities and opportunities for supporting the strengthening of the scientific and technical capabilities of NPFC.

Being member of 18 RFMOs/RFBs the EU is also mindful of the common responsibility to uphold the rules-based architecture of these multilateral organisations that greatly contribute in strengthening International Ocean governance.

We hope that at this meeting, the NPFC will be able to give full effect to the EU's membership through the endorsement of the updated EU fishing plan that will be discussed again this year.

The EU is looking forward cooperating in a constructive spirit with all NPFC Members at this meeting and in the future, in view of achieving the objectives of the NPFC Convention.

Thank you Chair,

Good day to all participants, and thanks for the opportunity granted to Panama to support our CNCP application.

During the last years Panama has raised professionals to work on fulfilling compliance standards of compliance required in each Organization.

- Panama adopted Law No. 204 of March 18, 2021, which regulates Fisheries and which is in the process of regulation and reorganization to robust the legal framework.
- FAO and Panama have worked together in this regulation
- dissuasive sanctions are being applied to fully deprive offenders.
- Adaptation and application of mechanisms for the management of surveillance, monitoring and control activities of the fleet, with 24/7 FMC coverage and increased cooperation between maritime and fisheries monitoring centers.
- Development of Memoranda of Understanding (MoU) to improve control of the operations of the Panamanian long-distance fleet, in third country ports.
- Fluent communication with RFMOs about vessels with license temporarily suspended and when this measure is lifted.
- Resolution ADM/ARAP No. 069 of December 2, 2022 established the requirements for transshipment and/or disembarkation of fishing vessels and activities related to national flag fishing in foreign ports, modifying the list of authorized ports using as reference the countries with which Panama maintains MOUs and in countries that maintain a system of MCS and exchange of information, in accordance PSMA and RFMO Measures.
- A transshipment platform has been implemented where all notifications and declarations are recorded and the operation is tracked. No transshipment activity is allowed without a prior assessment of the activity.
- - Currently, a platform for foreign flag arrivals (AREP) is maintained, with the first operational phase in which information is shared with various institutions in real time and arrivals and inspections are coordinated.
- - A monitoring platform has been developed for FMC monitoring alerts generated by the vessels, as well as the monitoring of their activities, which allows identifying, through a risk assessment, the measures to be taken to improve the control of the fleet.
- Executive Decree No. 245 of November 21, 2022 has been adopted, to cancel vessels whose owners or related companies are related to vessels or companies involved in IUU fishing activities.
- Cancel IFLs of vessels detected to be related to vessels or companies involved in IUU fishing

Unfortunately, due to the global challenges that all nations have faced in recent years our results have been slow to be seen in a positive way, but that will not be an impediment to continue fighting IUU activities, because in the end the maritime and fishing sector

Annex F: Statement by Panama

represents one of the main economic revenues to a developing country like Panama and we have no other intention than to take care of it and reiterate our commitment.

That is the last message we would like to convey to the plenary, that Panama is working based in the commitment to requirements stipulated in the NPFC's Rules of Procedure, as well as our efforts in ensuring flag state control.

We trust in the good judgment of the members of this Commission because in the end we share an objective which is the sustainability over time of those resources that due to the goodness of our oceans we have access to responsibly exploit them and if not what would be the sense of our existence. Panama remains with the door open to receive your doubts, comments, requests and why not, your cooperation, assistance or guidance, we consider that this spirit is the one that should prevail in an objective manner. Thank you very much for your attention.

**REPORT OF THE
NORTH PACIFIC FISHERIES COMMISSION
PERFORMANCE REVIEW PANEL**

31 August 2022

Penelope Ridings (Chair)
Huang-chih Chiang
Quentin Hanich
Jim Ianelli
Joji Morishita
Siquan Tian
Osvaldo Urrutia
Andrew Wright

The opinions expressed are those of the authors and do not reflect the opinions of their employers or any organization with which they are affiliated

Executive Summary and General Observations

1. The North Pacific Fisheries Commission (NPFC) was formally established in 2015 following nearly a decade of intergovernmental negotiations and preparatory conferences. The impetus for the establishment of the NPFC was the need to respond to the United Nations General Assembly Resolutions on bottom fishing and high seas fisheries. The NPFC was among the first regional fisheries management organizations (RFMOs) with a specific function of conserving and managing high seas fisheries resources including those associated with vulnerable marine ecosystems (VMEs).
2. NPFC is a small organisation which is responsible for conserving and managing a large number of stocks and fishery resources and associated ecosystem within the North Pacific Ocean. The fishery resources include stocks that are of cultural significance to some Members. We note that the NPFC is unique compared to other RFMOs in that several coastal states operate as distant water fleets in a variety of regions. This gives a different dynamic to the internal workings of the organisation than exists in some other RFMOs.
3. NPFC may be a young and small organisation, but all its Members are highly experienced and capable in international fisheries management and the operation of RFMOs. Its major success has been the adoption and implementation of interim measures consistent with the provisions of United Nations resolution 61/105 relating to the protection of VMEs in the Convention Area. It has also achieved success in a number of other areas. For compliance, it developed a high seas boarding and inspection regime shortly after its establishment which is implemented in an effective manner and with considerable commitment from Members. It has initiated a comprehensive and ambitious program of scientific research and seeks to draw not only on Members' scientific experts but also on independent experts. It is working on the development of management strategy evaluations (MSEs) as a prelude to the establishment of harvest control rules (HCRs) designed to meet fishery conservation objectives, with an initial focus on Pacific saury and Chub mackerel. To this end, it has initiated a science-managers dialogue on Pacific saury, which should facilitate the MSE process. These achievements are recognized and acknowledged.
4. However, progress in some other areas has been slow. The status of some of the NPFC priority stocks is poor and it has been difficult for the organization to agree on effective catch limits. Despite considerable efforts, there is a lack of fully standardised data collection methods and evident data gaps. Other than bottom fisheries, information on fishing impacts on non-target stocks and other species could be improved. The NPFC has not developed the full suite of compliance measures that might be expected even of a young RFMO. The NPFC is lacking a fully-fledged transshipment measure and its scientific observer program only covers bottom fisheries. There are no measures which address the responsibilities of port States, or problem areas such as fishing with long driftnets. Illegal, unreported and unregulated (IUU) fishing is an acknowledged issue in the NPFC Convention Area, with particular concerns over the number of vessels that hide their identification and registry, effectively operate without a flag, yet appear to land or tranship their catch in the region.
5. The lack of progress in some areas appears to be due to a number of factors. The NPFC is a high seas fisheries organization, where much of the fisheries resources are also found in areas under national jurisdiction of various Members. The different domestic assessments and standards are

Annex G: Report of the NPFC Performance Review Panel

difficult to rationalise and harmonise. There is an apparent lack of an imperative on Members to address important issues. This is compounded by a shortage of time assigned by the Commission to address complex issues during meetings, and a lack of personnel, including within some Members, to undertake all the work required for effective management of significant fisheries resources.

6. Progress in NPFC has also been affected by the impact of the COVID-19 pandemic, which has required meetings to be held virtually over the last two years. This occurred at a critical point in its development after it had built a firm foundation and was about to embark on important work, including MSE and an agreement on a Total Allowable Catch (TAC) for Pacific saury and the conclusion of a comprehensive transshipment measure. The postponement of the 2022 Commission meeting has exacerbated this.
7. The NPFC has developed a number of excellent initiatives since its establishment. However, some of these have not continued. There were sound ideas and good intentions when initiatives were conceived, but the effort has not been sustained to achieve these aspirations. There may be various reasons for this including the turnover among initiative ‘champions’ as well as inadequate resources for the task, both within NPFC Secretariat and in respect of the national resources devoted to NPFC.
8. These issues could be assisted were NPFC to have a clear strategy for prioritising the various elements of its work. However, there is no clear strategic direction for the organization, a lack of coordination and cross-engagement between the subsidiary bodies, a lack of time in the Commission to consider adequately the work of its subsidiary bodies, and no corporate plan to assist the Secretariat in supporting the Commission and subsidiary bodies. The subsidiary bodies would benefit from the Commission giving them more direction so that they fulfil the tasks set by the Commission within well-defined time frames.
9. To accomplish this goal the NPFC could have an enduring roadmap for what progress should be made and by when. This could be used to address the number of cross-cutting issues the Review Panel assessed as requiring priority attention. These include data collection and management; development of MSE; operational effectiveness of the NPFC; compatibility between coastal State measures and NPFC measures; formal agreement on strategic priorities; and transparency.
10. NPFC was relatively well evolved before its formal establishment. The driver was to respond to the UN General Assembly resolution on bottom fishing and to develop interim measures to protect VMEs from about 2006. The second stage after entry into force of the Convention in 2015 was to focus on priority species: Pacific saury, mackerels and squids. The organization is undertaking the usual fisheries science, fisheries management and compliance tasks of an RFMO in respect of these priority resources and progress has been made, but there is room for improvement.
11. The next stage is that NPFC should do more to strengthen its measures against IUU fishing, protect the wider marine environment and ecosystem, and address the future challenges of climate change and oceanic changes and their impacts on fisheries management. To protect its credibility and act responsibly, NPFC needs to demonstrate that it can make progress not only in the traditional work of an RFMO, but also on these broader issues many of which offer potential for meaningful cooperation with other organisations including other RFMOs in the Pacific Ocean.

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12. This issue is not only applicable to the NPFC, but is also applicable to other RFMOs. The issues identified and recommendations of the Review Panel are specific to NPFC, but they have a wider application to other RFMOs. The Review Panel hopes they may be useful to other RFMOs facing similar challenges.

TABLE OF RECOMMENDATIONS

TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
SCIENCE			
<i>Status of living marine resources</i>			
Recommendation 3.1.1. The SC should ensure rigour in management procedures (MP) for Pacific saury based on a fully explicit set of age structured models responsive to provisions of data and variability in the relative vulnerability of different age/size groups of Pacific saury	High	SC	Short
Recommendation 3.1.2. That the SC (and SSC for Pacific Saury) examine in greater detail the standardization of the data and indices used in the stock assessment and in the case of Pacific saury, the size and age composition traits over time.	High	SC SSC PS	Short
Recommendation 3.1.3. The Commission should agree and implement interim measures for Chub mackerel based on the work completed with respect to Chub mackerel stock assessments.	High	SC COMM	Short
Recommendation 3.1.4. That the SC continue to support measures that provide representative data of the ratio of Chub mackerel and Blue mackerel in catches, such as port sampling or other sampling methods, and that the stock assessment model account for this in a reasonable way.	Medium	SC	Medium
Recommendation 3.1.5. The SC should identify and describe standardised sampling gear for deepwater stocks in both Convention Area and EEZ fisheries to generate data on relative abundance and to address data gaps.	High	SC	Medium
Recommendation 3.1.6. The SC should seek to link footprint and effort data on squids and sardines using GIS tools in order to provide improved information on the spatial extent of the stocks and assist in providing advice on effort metrics.	Medium	SC	Medium
Recommendation 3.1.7. To increase the usefulness of the "footprint" data submitted by Members, measures of effort should be reconciled with vessel monitoring system (VMS) data, where possible.	Medium	SC	Medium
Recommendation 3.1.8. The SC and TCC should coordinate formal efforts to collect standardised data and validate bycatch of associated and dependent species.	High	SC TCC	Short
<i>Quality and provision of scientific advice</i>			
Recommendation 3.2.1. The SC should provide the Commission meeting with annual summaries of the status of the stocks and these should be made public.	High	SC	Short

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
Recommendation 3.2.2. The Commission should commit to a schedule for the development of full MSE, including MPs and HCRs for all priority stocks.	High	SC COMM	Short
Recommendation 3.2.3. If it occurs, the SC should communicate to the Commission the reasons for lack of consensus within the SC together with an identification of research needs to bridge gaps in the scientific understanding.	High	SC COMM	Ongoing
<i>Long-term planning and research</i>			
Recommendation 3.3.1. The SC should annually summarize progress taken towards each element in the Five Year Work Plan.	High	SC	Ongoing
<i>Best available science</i>			
Recommendation 3.4.1. That the SC develop guidelines for providing advice to the Commission that reflects standards of ‘best available science’: specifically, whether advice passes defensible tests against identified criteria for ‘best available science’ (data, statistical rigor, documentation, and peer review).	High	SC	Medium
Recommendation 3.4.2. That the SC pursue independent reviews of scientific advice to a greater extent.	High	SC	Medium
Recommendation 3.4.3. The Commission should develop a regional observer program to contribute to addressing science demands, resolve data gaps, improve data collection on bycatch, and monitor the implementation of measures.	High	SC TCC COMM	Short
Recommendation 3.4.4. The Commission should develop a program of work to examine the feasibility of introducing electronic monitoring (EM) in the NPFC Convention Area.	High	SC COMM	Medium
Recommendation 3.4.5. The Commission should endeavour to engage available expertise in science issues available to other institutions and organizations (such as PICES) and seek to foster collaboration on cooperative research projects.	High	SC	Medium

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
CONSERVATION AND MANAGEMENT			
<i>Conservation and Management Measures</i>			
Recommendation 4.1.1. That the Commission and Scientific Committee increase efforts to acquire the requisite data and conclude stock assessments for all NPFC fishery resources with particular attention to the priority stocks: North Pacific armorhead, Splendid alfonsino, Pacific saury, Chub mackerel, Blue (Spotted) mackerel, Japanese sardine, Japanese flying squid and Neon flying squid. These assessments should provide the knowledge and understanding required to adopt more enduring and scientifically validated CMMs to achieve sustainable levels of fishing mortality.	High	SC COMM	Medium
Recommendation 4.1.2. That pending the results of stock assessments and where information is lacking, the Commission adopt a precautionary approach (taking account of the risk of overfishing and whether stocks are overfished) to the setting of catch limits.	High	SC COMM	Short
Recommendation 4.1.3. That the Commission undertake a comprehensive review of existing CMMs to include verifiable objectives, address potential issues associated with interpretation by reducing the use of subjective terms and adopt baselines and measures of performance. This should be repeated regularly not less than every 5 years.	High	COMM	Long
Recommendation 4.1.4. That stand alone CMMs be dedicated to a single NPFC fishery resource and that multi-species CMMs be phased out as the results of stock assessments and Management Procedures become available.	Medium	COMM	Long
<i>Data collection and sharing</i>			
Recommendation 4.2.1. That the Commission increase efforts to characterise NPFC fisheries by expanding and harmonizing data collection formats for all species encounters, including bycatch, discards and species belonging to the same ecosystem or dependent upon or associated with the target stocks.	High	COMM	Medium

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
Recommendation 4.2.2. That the Commission task the Secretariat to contract a data management expert to undertake an intersessional review to assess data reporting formats for SC and TCC purposes and advise on opportunities for further standardization, undertake a comprehensive inventory of NPFC data, evaluate uncertainties associated with that data, identify data gaps and propose a schedule of data-related priority tasks and associated responsibilities to be annually reported to the Commission.	High	COMM	Short
Recommendation 4.2.3. That the Secretariat establish and maintain an inventory of NPFC non-public domain data on the section of the Commission's website restricted to Member-access, including justification for confidentiality, and a meta data inventory in the public domain on the Commission's website.	Medium	Sec COMM	Short
Recommendation 4.2.4. That the Commission dedicate effort and resources to the collection of data relating to bycatch and species taken incidentally in all NPFC fisheries.	High	SC COMM	Medium
Recommendation 4.2.5. That the SC and the TCC each undertake a comprehensive assessment, updated annually, summarizing the NPFC data inventories and the status of data gaps and deficiencies in NPFC data and report the outcomes to the annual session of the Commission.	High	SC TCC	Short
Recommendation 4.2.6. That the Commission seek opportunities for collaboration with other RFMOs with shared interests in the North Pacific Ocean and appropriate technical agencies, such as Global Fishing Watch (GFW) and the IMCS Network, to assess the level and impacts of IUU fishing on NPFC fishery resources.	High	TCC COMM	Short
Recommendation 4.2.7. That the Commission undertake an independent expert review of data-related policies and procedures currently implemented, or under development, in the SC and TCC, with the objective of critically reviewing existing policies and procedures against international best practice and experience in other RFMOs to strengthen and harmonize NPFC data management policies and procedures for all data functions across the Commission.	High	COMM	Short

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
<i>Capacity management</i>			
Recommendation 4.3.1. That the Commission prioritize the development of Terms of Reference to contract appropriate technical expertise to assist with developing advice on effort indicators for fishing capacity for all fisheries harvesting NPFC fishery resources.	High	COMM	Short
<i>Fishing allocations and opportunities</i>			
Recommendation 4.4.1. An agreed process for the allocation of fishing opportunities should be a long-term goal of the Commission.	Medium	COMM	Long
<i>Ecosystem approach to fisheries</i>			
<p>Recommendation 4.5.1. The implementation of the CMMs relating to bottom fishing and the protection of VMEs should be strengthened by requesting the:</p> <ul style="list-style-type: none"> • SC to undertake a review of the scientific aspects of the 50kg VME encounter threshold (including practices in other RFMOs) for possible revision; • SC to re-visit the recommendations of SC03 and SSC VME03 and provide a transparent assessment of the value of including sponges and hydrocorals as VME indicator taxa in conjunction with supporting an initiative to develop a quantitative method for the identification of VMEs; and • TCC to develop compliance-related reporting provisions for the Scientific Observer Program related to VME encounters, accompanied by a mechanism to deter non-compliance. 	Medium	SC TCC COMM	Medium
Recommendation 4.5.2. That the Commission and the SC develop strategies that address the lack of information needed to take ecosystem considerations into account for NPFC pelagic fisheries in the Convention Area, and include these in the SC's Research Plan, data collection procedures and obligations to better take into account ecosystem-related interactions, and how they might compare with compatible initiatives in areas under national jurisdiction.	High	SC COMM	Medium
Recommendation 4.5.3. That the Commission, at an early opportunity, develop and adopt CMMs addressing lost and discarded fishing gear, marine pollution and waste from fishing vessels, interactions with marine mammals, seabirds or sharks (particularly a prohibition on shark finning), and a prohibition on fishing with long driftnets in the NPFC Convention Area.	High	SC COMM	Medium

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
Recommendation 4.5.4. That the Commission recognize the importance of taking into account the known and anticipated impacts of climate change on the North Pacific Ocean ecosystem, including with respect to changes in the geographic and temporal distribution of stocks, notably Pacific saury.	High	COMM	Short
Recommendation 4.5.5. That the SC make appropriate provision in its current Research Plan to address current deficiencies associated with addressing the impacts of climate change on NPFC ocean ecosystems and associated fisheries.	High	COMM	Ongoing
COMPLIANCE AND ENFORCEMENT			
<i>Monitoring, control and surveillance measures</i>			
Recommendation 5.2.1. That, as a priority, the Commission adopt a new comprehensive conservation and management measure to regulate and monitor transshipments.	High	SC	Medium
Recommendation 5.2.2. That the Commission adopts, as a matter of priority, a Regional Observer Program that includes all fisheries and is based on a common understanding of the role and function of observers and common templates for the collection of scientific fisheries data and monitoring compliance with CMMs.	High	TCC COMM	Short
Recommendation 5.2.3. That the Commission adopt procedures to implement Article 17(4) of the Convention and clarify the circumstances in which fishing is to cease and vessels ordered to port for 'serious violations'.	Medium	TCC COMM	Short
Recommendation 5.2.4. That information from high seas boarding and inspections be used, subject to data management rules, to inform assessments under the Compliance Monitoring Scheme and the preparation of the Draft IUU Vessel List.	Medium	Sec COMM	Ongoing
Recommendation 5.2.5. That the Commission adopts a long-term strategy to address the problem of vessels without nationality engaged in IUU fishing, with specific steps for finding and collecting information about each vessel, including on beneficiaries of their fishing activities and their operational aspects.	Medium	TCC COMM	Long
Recommendation 5.2.6. That the Commission make full use of the information arising from at-sea inspections, including the possibility of vessels being included on the Draft IUU Vessel List.	High	TCC COMM	Ongoing
Recommendation 5.2.7. That the Commission develop processes for the reciprocal recognition of the IUU Vessel Lists of other RFMOs.	Low	TCC COMM	Medium

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
Recommendation 5.2.8. That the Commission consider adopting arrangements to prevent tampering with mobile transmitting units for accessing VMS data held by the Secretariat and to make VMS data available to support decisions of Members regarding the planning and when to conduct of high seas boarding and inspection.	Medium	TCC COMM	Medium
Recommendation 5.2.9. That the Commission focus on developing, improving and implementing other, more urgent MCS tools and postpone the development of regional market-related measures at this time.	Low	TCC COMM	Long
Recommendation 5.2.10. That the Commission continue to implement and improve its CMS, including by integrating, in the best possible way, all the MCS instruments at its disposal in order to supplement self-reporting by Members and CNCPs with verifiable data and information.	Medium	TCC COMM	Medium
Recommendation 5.2.11. That the Commission migrate from manual to automated reporting to gather compliance and enforcement data, in order to facilitate the CMS process.	Medium	TCC COMM	Short
Recommendation 5.2.12. That the Commission establish criteria and mechanisms to address instances of persistent, repeated or serious non-compliance and apply measures accordingly, such as demanding specific action plans from States involved and a specified schedule of appropriate penalties or sanctions.	Medium	TCC COMM	Long
<i>Flag State Duties and the requirements for Vessel Registration</i>			
Recommendation 5.3.1. That the Commission review the requirements for vessel registration to avoid demanding unnecessary information and to improve the registration process to prevent duplication and confusion.	Medium	TCC COMM	Medium
Recommendation 5.3.2. That the Commission clarify that all vessels undertaking support activities in the Convention Area, including bunkering, should comply with vessel registration requirements.	High	COMM	Short
Recommendation 5.3.3. That the Commission confirm the duty to have an IMO number for vessel registration by amending Annex I of CMM 2021-01.	High	COMM	Short
<i>Port State duties and minimum standards</i>			
Recommendation 5.4.1. That the Commission adopt, as a matter of priority, a conservation and management measure specifying minimum standards for port inspections, consistent with the FAO 2009 Port State Measures Agreement.	High	COMM	Medium

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
<i>Measures to deter nationals from engaging in IUU fishing</i>			
Recommendation 5.5.1. That the Commission consider the development of a specific scheme to implement the obligations under Article 17(7) so that Members and CNCPs take adequate measures to prevent their nationals from engaging in IUU fishing activities.	Medium	COMM	Long
DECISION-MAKING AND DISPUTE SETTLEMENT			
<i>Decision-making</i>			
Recommendation 6.1.1. That the work of the TCC SWGs be facilitated by having clear work programs and timetables for completion of intersessional work, reporting against work programs in annual reports to TCC, and meetings are held where feasible in person in order to expedite progress on difficult issues in the work program.	High	TCC	Ongoing
INTERNATIONAL COOPERATION			
<i>Relationship to co-operating non-Members</i>			
Recommendation 7.1.1. That the Commission decide whether to grant CNCP status on a biannual or an annual basis and apply a consistent approach to the granting of CNCP status.	Medium	COMM	Short
<i>Relationship to non-cooperating non-Members</i>			
Recommendation 7.2.1. That the Commission task the Secretariat to contact the flag States of fishing vessels and carrier vessels that are not authorized to fish in the Convention Area and those known to have an interest in fishing in the Convention Area and encourage them to seek CNCP status in NPFC and for the Secretariat to provide the Commission with an annual report on such outreach and on non-cooperating non-Member activities.	Medium	Sec COMM	Ongoing
Recommendation 7.2.2. That the Commission revise CMM 2016-03 to require Members to prohibit vessels flying their flag from utilising the services, including transshipment services, of vessels that are flagged to non-contracting parties that are not CNCPs in the Convention Area.	High	TCC COMM	Short
Recommendation 7.2.3. That where carrier vessels of non-contracting Parties and non-CNCPs are confirmed to have undertaken transshipment in the NPFC Convention Area of fisheries resources managed by NPFC, the vessels concerned should be placed on the NPFC IUU Vessel List in accordance with IUU vessel listing procedures.	High	TCC COMM	Short

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
<i>Cooperation with other international organizations</i>			
Recommendation 7.3.1. That the Commission task the Executive Secretary, in consultation with Members, to develop a prioritized program of work to strengthen practical cooperation with other organizations, including on data sharing and data management. This should include collaboration with WCPFC and IATTC as a priority	High	COMM	Short
Recommendation 7.3.2. That in addition to the development of any necessary formal linkages through MOUs, the Secretariat be encouraged to engage informally with staff in other RFMOs, including through the IMCS Network, to learn and share experiences of operational activities.	Medium	Sec	Ongoing
<i>Special requirements of Developing States</i>			
Recommendation 7.4.1. That the Commission demonstrate consideration of the special requirements of developing States, in particular SIDS, in its decision-making.	Medium	COMM	Ongoing
<i>Transparency</i>			
Recommendation 7.5.1. That Commission adopt, on advice of TCC, data security protocols which would enable observers, on signing of confidentiality agreements, to have access to data and information and access to meetings where such data and information is discussed.	High	COMM	Ongoing
Recommendation 7.5.2. That the Commission agree to the principle that meetings, including subsidiary body meetings, will be open to observers subject to rules of procedure which support that principle and are closed to observers only when strictly necessary.	High	COMM	Short
FINANCIAL AND ADMINISTRATIVE ISSUES			
<i>Availability of resources for NPFC activities</i>			
Recommendation 8.1.1. That the Commission encourage the SC and TCC to develop proposals for funding consideration from funds set aside in the Special Projects Fund.	Medium	COMM	Short
Recommendation 8.1.2. That the Commission, through NPFC Members, increase efforts to advance the Commission's work, in particular the development of Management Procedures (MPs) and Harvest Control Rules (HCR) for NPFC priority stocks, and the adoption and implementation of priority MCS measures.	High	Members	Ongoing

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TABLE OF RECOMMENDATIONS	PRIORITY	ROLE	TIMING
Recommendation 8.1.3. That proposals for new or revised conservation and management measures be accompanied by costings associated with additional responsibilities for the Secretariat to provide the support necessary for the implementation of the CMM and that this be endorsed by the Commission for inclusion in the budget at the time of the CMM's adoption.	High	COMM	Ongoing
Recommendation 8.1.4. That the new Executive Secretary undertake a review of staffing levels in the Secretariat, capabilities, and needs of the organization, with a view to presenting comprehensive proposals on staffing to the Commission in 2024.	Medium	Sec	Medium
<i>Efficiency and cost effectiveness</i>			
Recommendation 8.2.1. That the Commission task the Secretariat to develop a Corporate Plan to better inform the work of the NPFC Secretariat, to assist in ensuring financial and staff resources are appropriate in relation to expectations and to assist with the monitoring of the Secretariat's performance.	Medium	Sec COMM	Medium
Recommendation 8.2.2. That the Commission review the NPFC Document Rules with a view to ensuring that the website contains all information on past meetings, including the documents submitted, on the outcomes of intersessional decision-making and all other relevant information for Members, observers and the public.	High	COMM	Short

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Abbreviations and Acronyms

ABNJ Project	FAO areas beyond national jurisdiction deep seas project
BRP	Biological Reference Points
B _{MSY}	Biomass at Maximum Sustainable Yield
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
IPOA-IUU	2001 FAO International Plan of Action to Prevent, Deter and Eliminate IUU Fishing
CMM	Conservation and Management Measure
CMS	Compliance Monitoring Scheme
CNCP	Cooperating non-Contracting Party
EEZ	Exclusive Economic Zone
FAC	Finance and Administration Committee
FMC	Fisheries Monitoring Center
FAO	United Nations Food and Agriculture Organization
FIRMS	FAO Fisheries Information and Resource Monitoring System
F _{MSY}	Fishing Mortality at Maximum Sustainable Yield
GIS	Geographic Information Systems
GFW	Global Fishing Watch
HCR	Harvest Control Rule
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOTC	Indian Ocean Tuna Commission
IATTC	Inter-American Tropical Tuna Commission
IGO	Inter-governmental Organization
IMCS Network	International MCS Network
IUU	Illegal, Unreported and Unregulated fishing
MP	Management Procedure
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
MoC	Memorandum of Cooperation
MoU	Memorandum of Understanding
MTU	Mobile Transmitting Unit
MCS	Monitoring, Control and Surveillance
NGO	Non-Government Organization
NAFO	North Atlantic Fisheries Organization
NPFC	North Pacific Fisheries Commission
PSM	Port State Measures
RFMO	Regional Fisheries Management Organization
RFB	Regional Fisheries Body
SC	Scientific Committee
SAI	Significant Adverse Impacts
SSC	Small Scientific Committee
SSC BF-ME	Small Scientific Committee on Bottom fish and Marine Ecosystems
SSC PS	Small Scientific Committee on Pacific Saury

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SPRFMO	South Pacific Regional Fisheries Organization
SC	Scientific Committee
SWG	Small Working Group
SWG NPA-SA	Small Working Group on North Pacific Armorhead and Splendid Alfonsino
SWG NFS	Small Working Group Neon Flying Squid
SWG JFS	Small Working Group Japanese Flying Squid
SWG JS	Small Working Group Japanese Sardine
SWG BM	Small Working Group Blue Mackerel (= Spotted Mackerel)
SWG VME ¹	Small Working Group Vulnerable Marine Ecosystems
SWG OM	Small Working Group Operating Model (for Chub Mackerel)
SWG (Ops)	Small Working Group Operational Enforcement (TCC)
SWG (Development and Planning)	Small Working Group Development and Planning (TCC)
SWG AC ²	Small Working Group on Assessing Compliance (TCC)
SWG VR	Small Working Group on the Vessel Registry (TCC)
SWG VMS	Small Working Group on the Vessel Monitoring System (TCC)
SPF	Special Projects Fund
SAM	Stock Assessment Model
TCC	Technical and Compliance Committee
TWG	Technical Working Group
TWG CMSA	Technical Working Group on Chub Mackerel Stock Assessment
UNCLOS	The 1982 United Nations Convention on the Law of the Sea
UNFSA	The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (in force as from 11 December 2001)
UN ICSC	United Nations International Civil Service Commission
UNGA	United Nations General Assembly
VPA	Virtual population analysis
VME	Vulnerable Marine Ecosystems
WCPFC	Western and Central Pacific Fisheries Commission

¹ There were separate SSCs for Bottom fisheries and VMEs until a SC decision in 2019 to combine them: SC04 Final Report, para 13.

² The three TCC SWG on Assessing Compliance, on Vessel Registry and on the Vessel Monitoring System were disbanded in 2019: TCC04, Final Report, para 79.

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1. Introduction

1.1. History

1. Informal consultations began in 2006 on the development of a North Pacific Fisheries Commission (NPFC) in response to calls from the international community for States to take measures to address the impacts of fishing on vulnerable marine ecosystems (VMEs) on the high seas and to close the international jurisdictional gaps for high seas fisheries. Formal negotiations on the establishment of a regional fisheries management organization (RFMO) commenced in August of 2006. Ten rounds of formal negotiations were held between 2006 and 2012. In addition to concluding the text of the Convention the participants to the negotiations agreed in 2011 to interim measures aimed at protecting VMEs and the sustainable management of high seas bottom fisheries in the Convention Area pending the adoption of permanent measures by the Commission.
2. The Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean text was concluded by the negotiating Participants on February 24, 2012. The Convention entered into force on 19 July 2015, 180 days after the fourth ratification. Following a series of preparatory conferences, the NPFC held its first meeting in Tokyo in September 2015. The NPFC Secretariat was formally established in Tokyo on 3 September 2015.

1.2. NPFC Performance Review Panel

1.2.1. The Panel

3. Article 22 of the Convention provides for the Commission to organize regular reviews of the effectiveness of the conservation and management measures (CMMs) adopted by the Commission and compliance with the measures in meeting the objectives of the Convention. Such reviews may include examination of the effectiveness of the provisions of the Convention itself.
4. The NPFC Commission Members agreed through an intersessional decision-making process in August 2021 to undertake a performance review of NPFC during 2022. The Terms of Reference provide for the Commission to appoint a Review Panel comprised of eight persons:
 - Three internal experts who have experience in the NPFC context and a thorough understanding of the NPFC Convention, to be selected among Member delegates: a fisheries management specialist, fisheries science specialist, and a monitoring, control and surveillance specialist;
 - Four external experts with professional areas of expertise, to be selected the Commission following an agreed selection process and comprising: an international legal specialist who will serve as the Chair of the Review Panel, a fisheries management specialist, a fisheries science specialist, and a monitoring, control, and surveillance specialist; and
 - One from non-governmental organization observer groups who have attended meetings of the Commission and subsidiary bodies.

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5. The selection of the Review Panel was undertaken in accordance with the Terms of Reference and finalized in August 2021. The Panel was composed of the following:

Dr. Joji Morishita: Internal Fisheries Management Specialist
Dr. Siqun Tian: Internal Fisheries Science Specialist
Dr. Huang-chih Chiang: Internal Monitoring, Control and Surveillance Specialist
Dr. Penelope Ridings: External International Legal Specialist (Chair)
Andrew Wright: External Fisheries Management Specialist
Dr. Jim Ianelli: External Fisheries Science Specialist
Dr. Osvaldo Urrutia: External Monitoring, Control and Surveillance Specialist
Dr. Quentin Hanich: NGO Observer

6. The Secretariat was not part of the Review Panel but coordinated the administrative and logistics activities for the Review Panel and supported and facilitated its work. Annex 2 contains short biographies for the Review Panel members.

1.2.2. Criteria for NPFC Performance Review

7. The Commission agreed to specific criteria for the Review Panel to address, attached at Annex 1. The criteria follow those adopted by other RFMOs for their performance reviews and relate to conservation and management, including data management, compliance and enforcement, science, decision-making and dispute settlement, international cooperation and financial and administrative issues.

1.2.3. Approach of the Review Panel

8. The purpose of the performance review is to evaluate the Commission's performance against comprehensive criteria and against the objectives and principles set out in the Convention. The aim is to assess whether the NPFC meets its objectives, and on the basis of this evaluation to identify any areas where improvements could be made and to present recommendations to the Commission to address the issues identified.
9. The Terms of Reference set out the methodology to be used by the Review Panel. This consisted of meetings among members of the Review Panel, desktop studies based on NPFC and other documentation, and interviews with NPFC office holders including Chairs, representatives of NPFC Members, current and previous staff of the Secretariat and key stakeholders. The Review Panel developed a questionnaire based on the above criteria which was addressed to all NPFC Members, Cooperating non-Contracting Parties (CNCs) and observers. The Review Panel received ten responses from six Member delegations and two observers. Efforts were made by the Review Panel to ensure that those that wanted to have input into the Review Panel were provided the opportunity to do so. Members of the Review Panel attended some small group meetings, but due to postponements were not able to observe the Commission meeting or meetings of the Technical and Compliance Committee or Finance and Administration Committee.
10. All of the work of the Review Panel was undertaken virtually.

1.2.4. Structure of the Report

11. The report consists of eight sections. The first two provide introductory and background information relating to NPFC. The following five sections address each of the areas of the Performance Review criteria and include the Review Panel's consideration of factual information,

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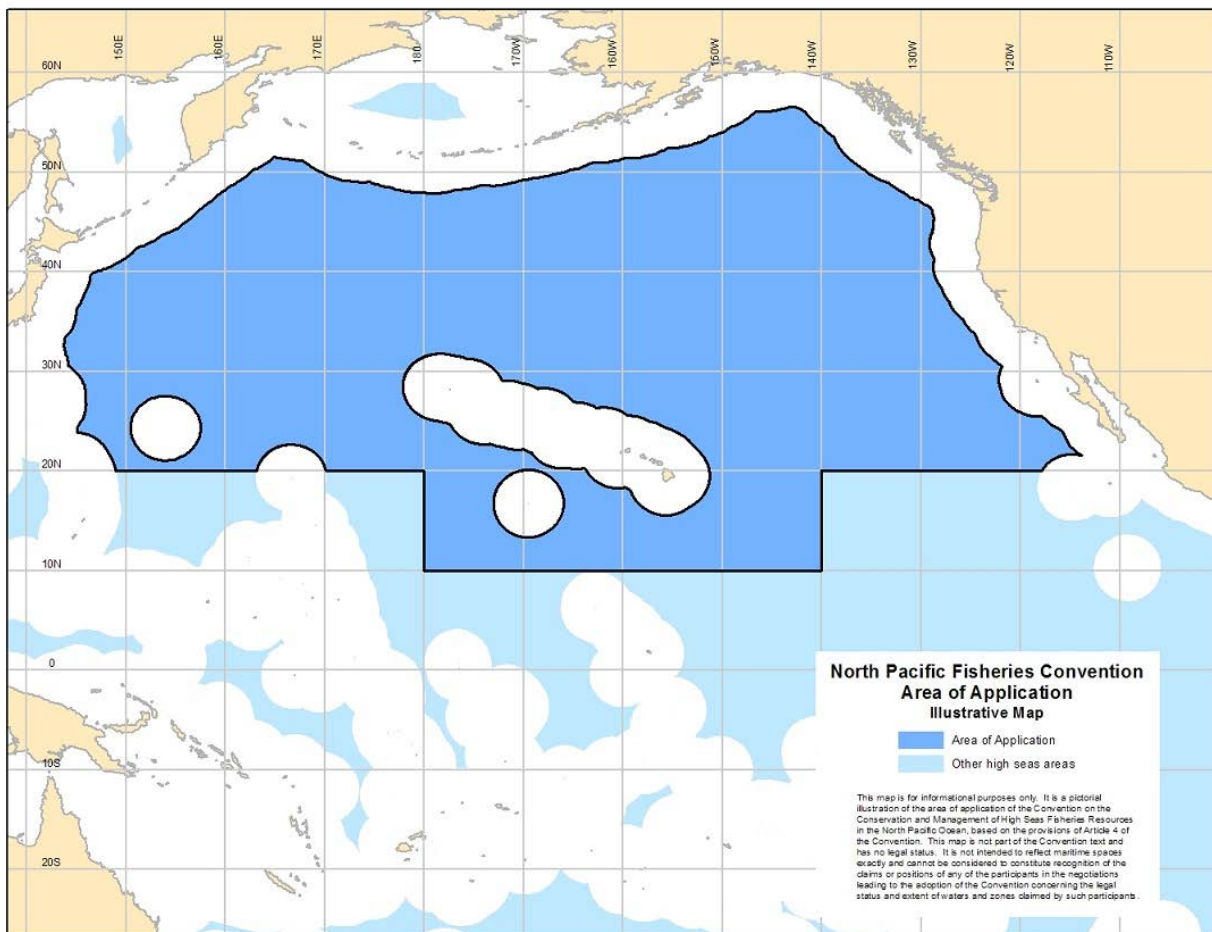
its assessment, key findings and recommendations. The Executive Summary contains some overarching observations and a table of recommendations. To assist the Commission in implementing the recommendations, the Review Panel has set out in the Table of Recommendations the priority the Review Panel gives to the recommendations (high, medium or low), which body it considers would be responsible for implementation, and a suggested timeframe for implementation (short, medium, long or ongoing).

2. Introduction to NPFC

2.1. Area of Competence and Fisheries

12. The NPFC area of competence (Convention Area) is the waters of the high seas area of the North Pacific, excluding the high seas areas of the Bering Sea and other high seas areas that are surrounded by the exclusive economic zone (EEZ) of a single State. In general, the high seas areas are those north of 20 degrees N latitude and bounded by relevant EEZs in the east, north and south. NPFC has prepared an indicative map of the NPFC Convention Area for illustrative purposes only and with disclaimers regarding the recognition of claims or positions of any of the participants in the negotiations (Figure 1 below).

Figure 1: Map of NPFC Convention Area



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13. The Convention establishes a Regional Fisheries Management Organization (RFMO) through which Parties will cooperate to ensure the long-term conservation and sustainable use of fisheries resources in the Convention Area. Fisheries resources defined by Article 1(h) of the Convention are all fish, molluscs, crustaceans and other marine species caught by fishing vessels within the Convention Area, excluding: (i) sedentary species insofar as they are subject to the sovereign rights of coastal States; and indicator species of vulnerable marine ecosystems as listed in, or adopted pursuant to the NPFC Convention; (ii) catadromous species; (iii) marine mammals, marine reptiles and seabirds; and (iv) other marine species already covered by pre-existing international fisheries management instruments within the area of competence of such instruments. The NPFC therefore does not cover fisheries managed by other RFMOs in the area, including the Western and Central Pacific Fisheries Commission (WCPFC) and the Inter-American Tropical Tuna Commission (IATTC).
14. The main high seas pelagic species caught within the NPFC Convention Area are Pacific saury (*Cololabis saira*), Chub mackerel (*Scomber japonicus*), Blue (Spotted) mackerel (*Scomber australasicus*), Japanese sardine (*Sardinops melanostictus*), Neon flying squid (*Ommastrephes bartramii*), and Japanese flying squid (*Todarodes pacificus*). Deep-sea species are caught on seamounts in the northwestern Pacific. The primary target of the bottom trawl fishery are North Pacific armorhead (*Pentaceros wheeleri*) and Splendid alfonso (*Beryx splendens*), and the primary target species of the bottom gillnet fisheries have been Splendid alfonso, Oreo (*Allocyttus verrucosus*), and Mirror dory (*Zenopsis nebulosa*). In the northeastern Pacific a seamount longline fishery includes catches of Sablefish (*Anoplopoma fimbria*).

2.2. Objectives and Responsibilities of the Organization

15. The objective of the Convention in Article 2 is to ensure the long-term conservation and sustainable use of fisheries resources in the Convention Area of the North Pacific Ocean, while protecting the marine ecosystems in which these resources occur. Article 3 of the Convention provides for certain actions to be taken to give effect to this objective which relate to responsible fisheries management. They include:
 - promoting the optimum utilization and ensuring the long-term sustainability of fisheries resources;
 - adopting measures, based on the best scientific information available, to ensure that fisheries resources are maintained at or restored to levels capable of producing the maximum sustainable yield;
 - adopting and implementing measures in accordance with the precautionary approach and an ecosystem approach to fisheries;
 - assessing the impacts of fishing activities on species belonging to the same ecosystem or dependent upon or associated with the target stocks and adopting, where necessary, conservation and management measures for such species;
 - protecting biodiversity in the marine environment, including by preventing significant adverse impacts on vulnerable marine ecosystems;
 - preventing or eliminating overfishing and excess fishing capacity;
 - ensuring that complete and accurate data concerning fishing activities are collected and shared;

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- ensuring that any expansion of fishing effort, development of new or exploratory fisheries, or change in the gear used for existing fisheries, does not proceed without prior assessment;
- ensuring that conservation and management measures established for straddling fish stocks on the high seas and those adopted for areas under national jurisdiction are compatible;
- ensuring compliance and enforcement of conservation and management measures; and
- minimizing pollution, waste from fishing vessels, discards and catch by lost or abandoned gear.

2.3. Structure of the Organization

16. The membership of NPFC is open to the States that participated in the Multilateral Meetings on the Management of High Seas Fisheries in the North Pacific Ocean, States and regional economic integration organizations whose fishing vessels wish to conduct fishing activities for fisheries resources in the Convention Area, and other coastal States of the Convention Area which are invited to join by consensus. The Convention also provides that a fishing entity whose vessels fish or intend to fish for resources may deposit an instrument expressing its firm commitment to abide by the Convention and CMMs adopted under it, in which case references to the Commission or Members of the Commission include the fishing entity.
17. The Commission currently has nine Members: Canada, People's Republic of China, European Union, Japan, Republic of Korea, Russian Federation, Chinese Taipei, United States of America and the Republic of Vanuatu. One State currently holds the status of CNCP: the Republic of Panama.

2.3.1. Commission

18. The Commission is the main decision-making body of NPFC and has a wide range of functions set out in Article 7 of the Convention. Among its functions are to adopt CMMs, determine total allowable catches and the nature and extent of participation in fishing for fishery resources, develop and establish effective monitoring, control, surveillance (MCS), compliance and enforcement, and supervise the organizational, administrative, financial and other internal affairs of the Organization.

2.3.2. Scientific Committee

19. The Scientific Committee (SC) was established by Article 10 of the Convention. Its functions include to: a) recommend to the Commission a research plan, including specific issues and items to be addressed by the scientific experts and identify data needs and coordinate activities that meet those needs; b) plan, conduct and review scientific assessments of the status of fishery resources and provide advice and recommendations to the Commission; c) assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stock; d) develop a process to identify VMEs and areas or features where they are known or likely to occur; e) establish science-based standards and criteria to determine if bottom fishing activities are likely to produce Significant Adverse Impacts (SAIs) on VMEs; f) develop rules and standards for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data; and (g) provide such other scientific advice

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to the Commission and its subsidiary bodies as it considers appropriate. Participants in the SC are experts from Members and CNCPs, as well as observers and other invited experts. The SC usually meets annually in advance of the Commission meeting. It has established a number of subsidiary bodies and small working groups that usually meet intersessionally and undertake work in line with the current Five-Year Research Plan and Work Plan of the Scientific Committee, 2021-2025, which is the second multi-year Work Plan adopted by the SC.

2.3.3. Technical and Compliance Committee

20. The Technical and Compliance Committee (TCC) was established by Article 11 of the Convention. Its functions are to: a) monitor and review compliance with conservation and management measures adopted by the Commission and make recommendations to the Commission; and b) review the implementation of cooperative measures for MCS and enforcement adopted by the Commission and make recommendations to the Commission. TCC meetings are held immediately prior to the annual Commission meeting. The TCC has established two Small Working Groups which report annually to the TCC: i) Planning and Development, and ii) Operations.

2.3.4. Finance and Administration Committee

21. The Commission established the standing Finance and Administration Committee (FAC) as a subsidiary body pursuant to Article 6 (1) of the NPFC Convention at its second Annual Session in 2016. The purpose of the FAC is to provide advice and recommendations to the Commission on matters related to the budget, finance and administration of the Commission. It meets in the day or days prior to the commencement of the Regular Commission meeting.

2.3.5. Secretariat

22. The Secretariat for NPFC is headquartered in Tokyo, Japan. An Agreement regarding Privileges and Immunities of the NPFC was signed between NPFC and Japan on 30 November 2015 and grants standard privileges and immunities to the organization and international staff. The Secretariat is headed by an Executive Secretary who is responsible for the management and supervision of the Secretariat and the provision of advice to the Commission. The terms and conditions of the staff of the Secretariat are governed by rules adopted by the Commission.

3. Science

3.1. Status of living marine resources

23. The SC has recognized eight priority species on which scientific work is to be prioritized:
 - four pelagic fish species, Pacific saury *Cololabis saira*, Chub mackerel *Scomber japonicus*, Blue mackerel (previously called Spotted mackerel) *Scomber australasicus*, and Japanese sardine *Sardinops melanostictus*;
 - two squid species, Neon flying squid *Ommastrephes bartramii* and Japanese flying squid *Todarodes pacificus*;

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- and two bottom fish species, North Pacific armorhead *Pentaceros wheeleri* and Splendid alfonsino *Beryx splendens*.³
24. The SC has established several subsidiary bodies and small working groups to address science-related issues to these priority stocks. These are the Small Scientific Committee (SSC) on Bottom Fish and Marine Ecosystems (SSC BF-ME), the SSC on Pacific Saury (SSC PS), and the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA). In addition, the following small working groups (SWG) currently operate:
- North Pacific Armorhead and Splendid Alfonsino (SWG NPA-SA)
 - Neon Flying Squid (SWG NFS)
 - Japanese Flying Squid (SWG JFS)
 - Japanese Sardine (SWG JS)
 - Blue Mackerel (= Spotted Mackerel, SWG BM)
 - Vulnerable Marine Ecosystems (SWG VME)⁴
 - Operating Model (for Chub Mackerel, SWG OM)
25. These groups provide the backbone for developing SC advice on the status and trends of the stocks under the purview of the NPFC. The sections below provide a brief summary of these activities.

3.1.1. Pacific saury

26. Pacific saury (*Cololabis saira*) is widely distributed from the subarctic to the subtropical regions of the North Pacific Ocean. The fishing grounds are west of 180° E and are fished by NPFC Members China, Japan, Korea, Russia, Chinese Taipei, and Vanuatu. The fishing method used is primarily by stick-held dip net, although some gill nets are also used. The NPFC has a dedicated Small Scientific Committee on Pacific Saury (SSC PS) where most of the discussion and analysis on the Pacific saury stock takes place.
27. Figure 2 shows the trend in Pacific saury catches between 1950 and 2021. Catches have increased over the last three decades, with catches in 2014 reaching 621,000 tonnes, and have subsequently declined. Preliminary data from 2021 showed a sharp decline in catch and nominal CPUE from 2020 to 2021, continuing the declining trend that had occurred over recent years. The spatial distribution of the fishing grounds has also shifted, with fishing grounds shifting to the east and a higher proportion of catch occurring in the Convention Area compared to previous years.⁵ Pacific saury is a short-lived pelagic species with potential changes over time in recruitment due to environmental factors,⁶ and in the relationship between environmental factors and the ecology of Pacific saury.⁷

³ These were based on a proposal presented by the Secretariat (NPFC01-2016-SC01-WP04) to SC01 (para 38) and adopted by the Commission at its 2016 session (COM01, para 15).

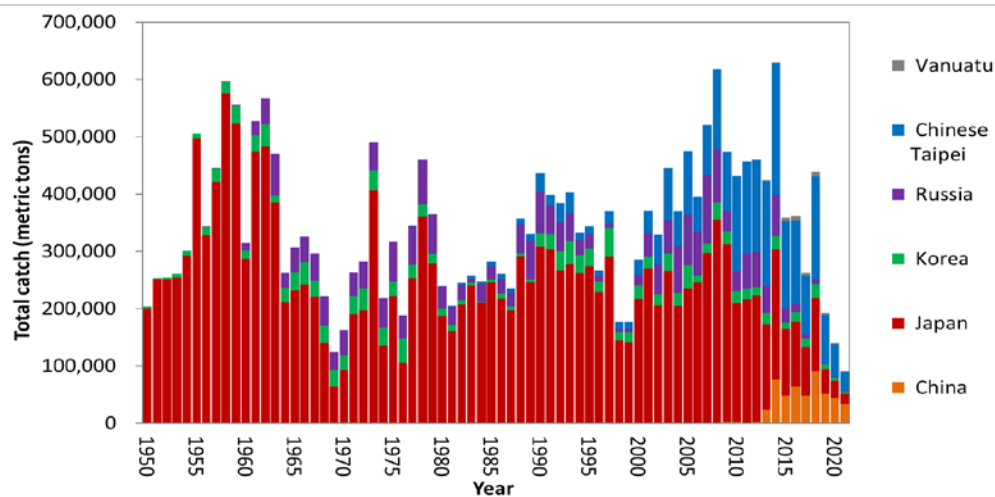
⁴ There were separate SSCs for Bottom fisheries and VMEs until a SC decision in 2019 to combine them: SC04 Final Report, para 13.

⁵ SSC PS08 Final Report, para 16.

⁶ SSC PS Final Report, Annex D: Stock Assessment Report for Pacific Saury, p. 26.

⁷ SSC PS07 Final Report, para 23.

Figure 2: Time series of Pacific saury catch by Member during 1950-2021⁸



28. A collaborative approach has been taken to the stock assessment of Pacific saury with an agreed provisional stock assessment model for Pacific saury using the years 1980-2021 and analysis conducted by three Members using agreed specifications.⁹ The results from the combined model estimates indicate that the stock has declined to current low levels of stock biomass, which had been relatively high prior to 2011, to a historical low during 2011-2021. Stock biomass has likely been at near a record low level in 2021.¹⁰ During 2011-2021 catches were usually greater than or equal to F_{MSY} and this has contributed to the recent decline in biomass.
29. The SSC PS recommended, and the SC endorsed, the following:¹¹
- i. The current annual total allowable catch (TAC) for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach ($B_{2021}F_{MSY} = 192,804$ tons) and the current biomass is much lower than B_{MSY} . Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).
 - ii. A harvest control rule (HCR) that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.
30. This is likely to be considered at COM07. Harvest Control Rules (HCR) and reference points have not yet been established for Pacific saury. However, it is recognized that an HCR is needed and work on this is underway.¹² The NPFC has made progress on the development of Management Strategy Evaluation (MSE) for Pacific saury. It has established a joint SC-TCC-COM Small Working Group on Pacific saury, which held its first meeting in February 2022. The SWG MSE

⁸ SSC PS Final Report, Annex D: Stock Assessment Report for Pacific Saury.

⁹ See further SSC PS Final Report, Annex D: Stock Assessment Report for Pacific Saury.

¹⁰ SC06 Final Report, Annex N.

¹¹ SSC PS08 Final Report, para 37; SC06 Final Report, para 13.

¹² SCC PS08 Final Report, Annex D.

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PS aims at developing an interim HCR within 2 years, followed by the mid-term goal (3-5 years) of developing a set of candidate management procedures (MPs) through an MSE process.

3.1.1.1. Review Panel's findings relating to Pacific saury assessments

31. A relatively data-poor method is used for the Pacific saury stock assessment involving a surplus production model. Such models require some significant assumptions which can be easily violated. The assessment documents focus directly on quantities related to theoretical F_{MSY} values and omit considerations such as retrospective analyses that may show how estimated values may have changed historically.¹³ An obvious alternative might be to look at the age structure of the different fisheries and characteristics of Pacific saury.¹⁴ The SSC PS has tested age/size structure models, and although information exists on the size and ages of Pacific saury catch, there may be issues with current data quality. Member scientists have been encouraged to develop age-structured models for Pacific saury.¹⁵ The Review Panel believes the SC should consider revisiting age-structured models for Pacific saury, particularly among fleets and regions. While production models might be useful for MPs, their tests should be based on a fully explicit set of age structured models that can suitably drive provisions of data and variability in the relative vulnerability of different age/size groups of Pacific saury. The SC should ensure that MP testing is sufficiently rigorous as measured against the Terms of Reference for the PS MSE.¹⁶ This recommendation was also noted in Kell 2019.¹⁷
32. Issues relating to developing a more direct connection between the assessment, catch advice, and CMMs have suffered due to the delays in holding Commission meetings. Progress on implementing a MP is underway and the schedule seems to be accelerated given the tasks at hand. Some respondents to the Review Panel's questionnaire expressed disappointment that progress was hampered by diversion to Chub mackerel MSE work.

3.1.1.2. Review Panel's recommendation relating to Pacific saury

Recommendation 3.1.1. The SC should ensure rigour in management procedures (MP) for Pacific saury based on a fully explicit set of age structured models responsive to provisions of data and variability in the relative vulnerability of different age/size groups of Pacific saury.

Recommendation 3.1.2. That the SC (and SSC for Pacific Saury) examine in greater detail the standardization of the data and indices used in the stock assessment and in the case of Pacific saury, the size and age composition traits over time.

3.1.2. Chub mackerel and Blue (Spotted) mackerel

33. Chub mackerel is widely distributed in the North Pacific and is caught using mostly purse-seine, set net, and dip net. Annual catches by Japan and Russia were about 1,000,000 tonnes in the 1970s, but decreased rapidly in the 1980s, and recorded the lowest value (24,000 tonnes) in 1991.¹⁸ In

¹³ NPFC-2021-SSC PS08-WP03, NPFC-2021-SSC PS08-WP02 (Rev. 1).

¹⁴ For example, as provided in NPFC-2021-SSC PS07-WP21.

¹⁵ Summary, 1st Intersessional Meeting of the Small Scientific Committee on Pacific Saury, June 28, 2022: NPFC-2022-SSC PS09-WP02, p. 3.

¹⁶ Terms of Reference for Joint SC-TCC-COM small working group on MSE for Pacific saury.

¹⁷ Lawrence Kell, *Review of Target and Limit Reference Points*, Consultancy Report, NPFC-2019-W5 BRP_HCR_MSE01-WP01 (Rev. 1).

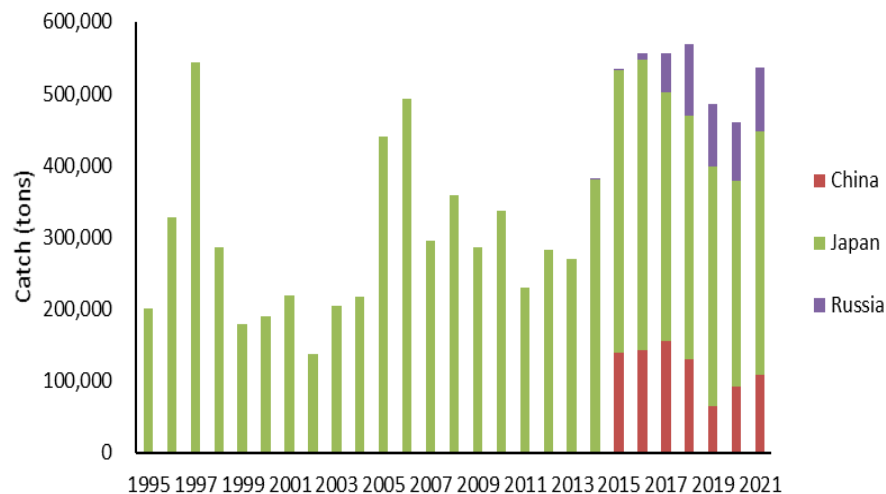
¹⁸ NPFC Priority Species: <https://www.npfc.int/priority-species>.

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1990-2000s, catches generally remained at a relatively low level but have increased since then (Figure 3). Since 1997 Japan has introduced a domestic TAC for the management of mackerels (Chub mackerel and Blue mackerel).¹⁹

34. SC06 noted that the TWG CMSA intends to conduct a preliminary stock assessment for Chub mackerel in 2022 and a complete stock assessment is planned 2023.²⁰ Members have presented different stock assessment models to the TWG CMSA.²¹ The TWG has developed revised priority performance measures for evaluating the stock assessment models.²² The TWG CMSA is to select the stock assessment model based on technical work and discussions conducted by the SWG OM. The TWG CMSA agreed to hold further discussions of candidate biological reference points.²³
35. The SC has updated the species profile for Blue mackerel, which it has recognized as the common name for *Scomber australasicus* (instead of Spotted Mackerel).²⁴

Figure 3: Time series of Chub mackerel catch by Member during 1995-2021



3.1.2.1 Review Panel's findings relating to Chub mackerel and Blue (Spotted) mackerel

36. The assessment of Chub mackerel has lagged, despite being pinned as one of the first CMMs adopted with a mandate to undertake a stock assessment as soon as practicable (in 2016).²⁵ However, work is underway on a Chub mackerel stock assessment and indications are that the

¹⁹ SC06 Final Report, Annex K, p. 84.

²⁰ SC06 Final Report, para 9.

²¹ TWG CMSA05-Final Report, paras 16-22.

²² TWG CMSA05-Final Report, para 32, para 59(b) and Annex D.

²³ TWG CMSA05-Final Report, para 54.

²⁴ SC06 Final Report, Annex K, pp. 83-92.

²⁵ CMM 2016-07.

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stock is in decline. This suggests the need for a precautionary approach to management, using assessments that are available.

37. The TWG CMSA was attended by one panel member. His findings were that the process of development has been well laid out²⁶ and that the TWG had gone more than halfway through the planned work. However, there appears to be a disconnect between the software being used and Member scientists' familiarity with the software. For example, a discussion about one Member's model led to some concerns that apparently were left unanswered *until they could be discussed with the model developer*. In another instance dealing with the Stock Assessment Model (SAM) versus Virtual Population Analysis (VPA) document,²⁷ without getting too detailed, the differences between the results were considerable. It is suggested that given issues with doing VPA in general (and in this paper a poor retrospective pattern), this approach should be abandoned.
38. Japan has conducted stock assessments on the Pacific stock of Blue mackerel which is distributed in the NPFC Convention Area.²⁸ However, there is limited information and data available on Blue mackerel. Catch statistics specific to Blue mackerel in the NPFC Convention Area are not available because combined catch of Chub and Blue mackerels have been reported to NPFC.²⁹ Japan uses port sampling data to estimate catches of Blue mackerel,³⁰ while China obtains this from the fishing companies.³¹ Information on stock status relative to BRPs are lacking and are presently unavailable.

3.1.2.2. Review Panel's recommendations relating to Chub mackerel and Blue (Spotted) mackerel

Recommendation 3.1.3. The Commission should agree and implement interim measures for Chub mackerel based on the work completed with respect to Chub mackerel stock assessments.

Recommendation 3.1.4. That the SC continue to support measures that provide representative data of the ratio of Chub mackerel and Blue mackerel in catches, such as port sampling or other sampling methods, and that the stock assessment model account for this in a reasonable way.

3.1.3. Deepwater stocks

39. SC06 has adopted species summaries for North Pacific armorhead,³² Splendid alfonsino,³³ Sablefish,³⁴ and Blackspotted and Rougheyeye rockfishes.³⁵ Historical catches of North Pacific armorhead by Russia and Japan from the combined Emperor Seamounts reached 100 thousand tons in 1970s, followed by a crash (Figure 4). Splendid alfonsino has been exploited as an alternative resource to the armorhead due to the fluctuations in the armorhead population.³⁶ Catch rates for Splendid alfonsino appear to reflect the recruitment of North Pacific armorhead, with annual catch rates decreasing below 1,000 tonnes over 2010-2012, with some increases up to 4,000

²⁶ Annex G of NPFC-2022-TWG CMSA05-Final Report.

²⁷ NPFC-2022-TWG CMSA05-WP06.

²⁸ SC06 Final Report, Annex K, p. 84.

²⁹ SC06 Final Report, Annex K, p. 87.

³⁰ Ibid, p. 87.

³¹ Ibid p. 86.

³² SC06 Final Report, Annex D, pp. 25-31.

³³ Ibid, Annex E, pp. 32-39.

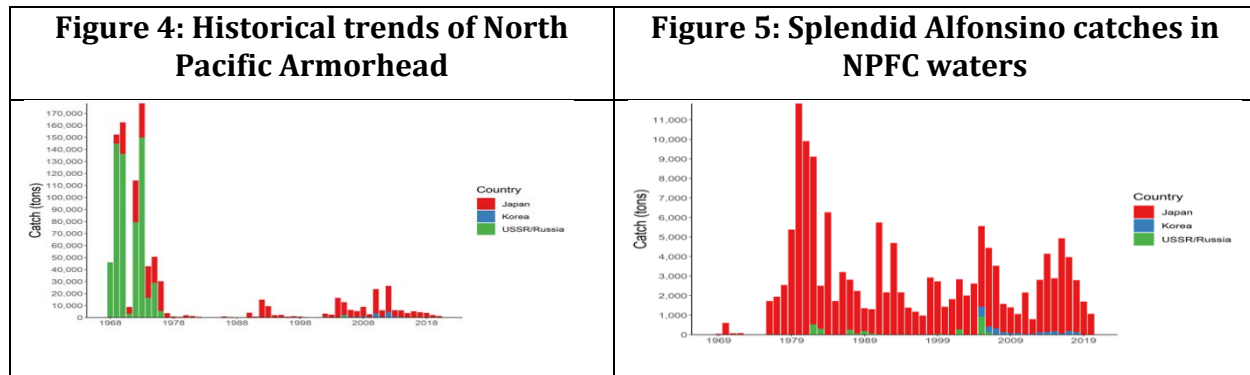
³⁴ Ibid, Annex F, pp. 41-48.

³⁵ Ibid, Annex G, pp. 49-58.

³⁶ SC06 Final Report, p. 33.

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tonne in the years since (Figure 5).³⁷ Currently North Pacific armorhead and Splendid alfonso are caught by Japan and Korea on the Emperor seamount using bottom trawls and gillnets. The SC has noted the decreasing trends and apparent poor status of the North Pacific armorhead stock, particularly as catch rates of North Pacific armorhead decline, fishing effort is transferred to splendid alfonso the status of which is also an increasing concern to scientists.³⁸



3.1.3.1. Review Panel's findings relating to deepwater stocks

40. There is no current or accepted assessment for North Pacific armorhead or Splendid alfonso and no biomass estimates available for either species in NPFC waters.³⁹ The Terms of Reference for stock assessments for North Pacific armorhead and Splendid alfonso have been adopted by the SC.⁴⁰
41. Sablefish (*Anaplopoma fimbria*) is caught in the Northeastern Pacific area of the NPFC Convention area by Canada and within their EEZs by both Canada and the United States. Canada and the US have undertaken their own stock assessments in the three domestic jurisdictions Alaska (US), British Columbia (Canada) and the US West Coast (US) where Sablefish are harvested.⁴¹ Sablefish is managed within their EEZs by Canada and the US and NPFC has a CMM in place for Sablefish in the NPFC Convention Area.
42. Blackspotted and Rougheye rockfishes are captured in the longline trap fishery that targets Sablefish on seamounts in the eastern part of the NPFC Convention Area.⁴² No stock assessment is conducted for Blackspotted and Rougheye rockfishes in the NPFC Convention Area and it is unclear if the Blackspotted and Rougheye rockfish population on seamounts in the Convention Area is distinct from the population on the continental shelf of Canada and the US.⁴³

³⁷ Ibid.

³⁸ SC06 Final Report, Annex E.

³⁹ SC06 Final Report, p. 28 at p. 35.

⁴⁰ SC06 Final Report, para 11.

⁴¹ SC05 Final Report, p. 41.

⁴² SC06 Final Report, p. 50.

⁴³ SC06 Final Report, p. 50.

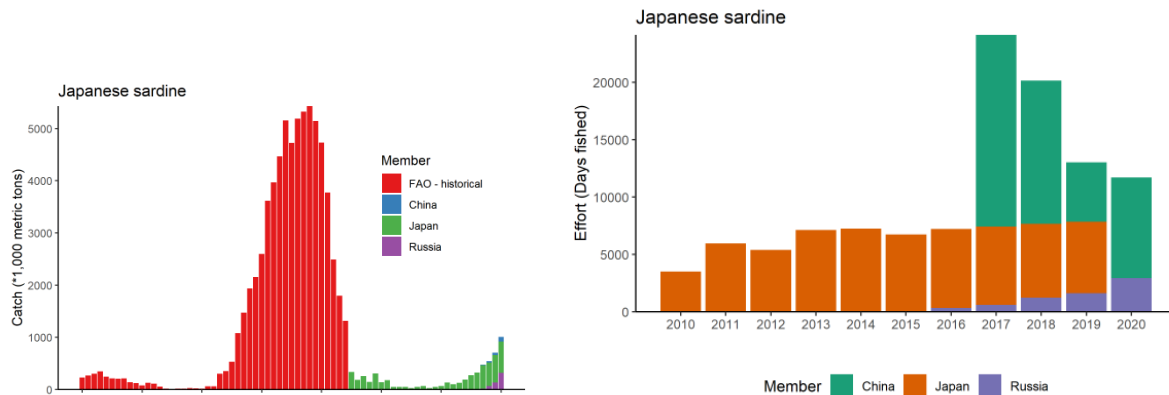
3.1.3.2. Review Panel's recommendation relating to deepwater stocks

Recommendation 3.1.5. The SC should identify and describe standardised sampling gear for deepwater stocks in both Convention Area and EEZ fisheries to generate data on relative abundance and to address data gaps.

3.1.4. Squids and sardines

43. The two squid species, which are both priority species, are Japanese flying squid and Neon flying squid. The SC has developed recent species summaries for Japanese flying squid,⁴⁴ and for Neon flying squid.⁴⁵ Japanese flying squid is caught by Japan, Russia, and China both inside their EEZs and in the Convention Area using jigging and mid-water trawl. Neon flying squid is harvested by China, Japan, Korea, Russia, Chinese Taipei, and Vanuatu in the Convention Area using jigging, drift net, dip net and set net.

Figure 6: Historical trends of sardine catch



44. China, Japan, and Russia catch Japanese sardine. China does not target the species, but it is captured as bycatch in other fisheries (e.g., Chub mackerel). Catches are primarily by purse seine, with a smaller component of the catch taken by pelagic trawl. China's catch of Japanese sardine is taken exclusively from the Convention Area from April to December. China's existing catch records are from 2016 to 2020 and show increasing catches during that period as the stock may have been increasing. The historical catches (prior to 2016) are unknown but are thought to be low and need to be confirmed.
45. Japan's fishery for Japanese sardine occurs inside their EEZ and is mostly conducted by large purse seine vessels (>90% of the catch). Additional components of the fishery include set nets, dip nets and other gears. The fishery experienced very high catches in the 1980's and early 1990's, a decline to very low catches from 1995 to ~2010 and has been recovering since then. The fishery is conducted year-round, but mainly during the summer season.

⁴⁴ SC06 Final Report, Annex J, pp. 74-82.

⁴⁵ SC06 Final Report, Annex H, pp. 59-67.

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3.1.4.1. Review Panel's findings relating to squid and sardines

46. Japan has conducted a stock assessment annually for two stocks of Japanese flying squid since 1997 and has set a Japanese domestic TAC based on these results.⁴⁶ The NPFC has not established biological reference points (BRPs) and no stock assessment has been conducted for Japanese flying squid in the Convention Area. Work is underway on updating and reviewing catch and effort data, continuing research on the spatial structure and impact of environmental variables and reviewing Members' approaches to stock assessments.⁴⁷
47. The second squid species is Neon flying squid. Some Members have conducted stock assessments or related studies for Neon flying squid based on information from their own fisheries, but no unified stock assessment has been conducted by NPFC for the species.⁴⁸ Work is underway on compiling and sharing data, research, including on spatial structure, and reviewing Member's approaches to stock assessments. The SC has noted that Neon flying squid has a complicated life-history and biology: it is a short-lived species, likely to be susceptible to fluctuations in biomass subject to environmental conditions, is highly migratory, has separate areas of reproduction and feeding, and has seasonal cohorts.⁴⁹ This is likely to pose scientific challenges for stock assessments and management.
48. A species summary has been prepared by the SC for Japanese sardine.⁵⁰ Japanese sardines are caught by Japan and Russia within their EEZs and by China as a bycatch. Catches are primarily by purse seine, and to a lesser extent by pelagic trawl. The NPFC has not established BRPs and no stock assessment has been conducted for the Convention Area. Similar research is to be conducted as in the case of the two squid species with a view to summarizing potential challenges for a Japanese sardine stock assessment.⁵¹
49. The NPFC's website contains useful detail on the "footprint" of different fisheries (as spreadsheets). These highlight available data and patterns in effort and recorded catch by Members. Linking these with geographic overlapping analyses using Geographic Information System (GIS) tools, may be useful to better understand the overlap and domain of the stocks in question and may help provide advice on whether and how effort increases, including of new entrants into the fishery, may be possible. Some responses to the Panel's questionnaire noted that effort measures are limited and this affects the ability to scientifically validate precautionary measures which use language such as "limit the growth in effort" until such time as better information becomes available. This is exacerbated as the current definition of "effort" based on the number of authorized fishing vessels, or the number of active vessels, is not an efficient means to assess and monitor fishing mortality on stocks.⁵²

⁴⁶ SC06 Final Report, Annex J, p. 75.

⁴⁷ SC06 Final Report, para 21.

⁴⁸ SC06 Final Report, p. 60.

⁴⁹ SC Final Report, para 19.

⁵⁰ SC06 Final Report, Annex I, pp. 68-73.

⁵¹ SC06 Final Report, para 23.

⁵² TCC04 Final Report, paras 16-18.

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3.1.4.2. Review Panel's recommendation relating to squid and sardines

Recommendation 3.1.6. The SC should seek to link footprint and effort data on squids and sardines using GIS tools in order to provide improved information on the spatial extent of the stocks and assist in providing advice on effort metrics.

Recommendation 3.1.7. To increase the usefulness of the "footprint" data submitted by Members, measures of effort should be reconciled with vessel monitoring system (VMS) data, where possible.

3.1.5. Status of associated or dependent species that belong to the same ecosystem

50. The NPFC SC has as a priority “Ecosystem approach to fisheries management: understand ecological interactions among species and impacts of fishing on fisheries resources and their ecosystem components”.⁵³ Under the category of activity labelled “Ecological Interactions” the SC has specified as an action item to “Understand ecological interactions among species in the North Pacific Ocean” for each of the future years. Additionally, the SC will “Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards” under concerns on impacts of fishing.

3.1.5.1. Review Panel's findings relating to ecologically related species

51. Systematic studies by NPFC have thus far focused on the associated and dependent species in the bottom fisheries. Most other species lack directed studies. As noted above, species summaries have been completed for Blackspotted and Rougheye rockfishes which are associated with the Sablefish fishery. Respondents to the Review Panel's questionnaire indicated concern over shark-finning and other bycatch issues (while others noted less concern for bycatch due to the selectivity of gears used). While outside the scope of directed fishery “management” advice, having some indication of the levels of catch of associated and dependent species, and activities such as shark-finning, would reflect a responsible approach to fishery management.
52. Attention has also been paid to VME indicator taxa (for example sponges and hydrocorals). SC03 recommended to the Commission that it expand the approved list of NPFC VME indicator taxa to include Hydrocorals and Sponges (*Stylasteridae* and *Porifera*).⁵⁴ In response the Commission requested the SC to determine whether or not the current indicator taxa were sufficient for determining VME.⁵⁵ The responses to the questionnaires were mixed related to these issues, which likely reflects the difficulty in addressing VME issues when scientific data are highly uncertain and where policy mandates also vary.

3.1.5.2. Review Panel's recommendations relating to ecologically related species

Recommendation 3.1.8. The SC and TCC should coordinate formal efforts to collect standardised data and validate bycatch of associated and dependent species.

3.2. Quality and provision of scientific advice

53. Article 3 (c) of the Convention includes among the actions to be taken to give effect to its objective “adopting and implementing measures in accordance with the precautionary approach and an ecosystem approach to fisheries, and in accordance with the relevant rules of international law”.

⁵³ Five-Year (2021-2025) Research Plan and Work Plan of the Scientific Committee.

⁵⁴ SC03 Final Report, para 44 (c).

⁵⁵ COM04 Final Report, para 12 (a).

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According to Article 10(4)(d), the Scientific Committee shall “assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks”.

54. NPFC is making progress in its approach to MSE, especially in recognizing the importance of a science-managers dialogue to promote exchanges between scientists and managers so that candidate MPs can be modelled to aid decision-making. This was a recommendation from a Workshop held in March 2019 on BRP/HCR/MSE where a number of experts provided valuable information on the nature of a MSE process.⁵⁶ The Workshop recommended conducting MSE for only one species at a time due to the resource-intensive and complex nature of the process, and suggested Chub mackerel as a first priority as it was a longer lived species than Pacific saury.⁵⁷ These recommendations were endorsed by the SC.⁵⁸ However, on the basis of a TCC recommendation,⁵⁹ and a Japanese proposal,⁶⁰ the Commission decided to establish a joint SC-TCC-COM Small Working Group in 2021 to work on the establishment of a MP to be formulated through an MSE process and HCR for Pacific saury, given the urgent need for effective management of the stock.⁶¹

3.2.1. Review Panel’s findings on the quality and provision of scientific advice

55. Based on responses from the questionnaire, efforts to receive and act on the best scientific advice relevant to fishery resources was limited (no respondents agreed that this occurred).
56. The SC is undertaking MSEs for highlighted stocks and this can provide a robust way to evaluate management by balancing trade-offs among competing objectives. However, given the perceived lack of commitment from the Commission, improved support is required. Developing predictable TACs for Pacific saury through an MSE would improve the application of science to management decisions by the Commission.
57. Relative to other NPFC subsidiary bodies, the SC work seems undervalued based on time allotments during the Commission meetings. This is quite common among RFMOs but here the distinction may relate to trust of the scientific advice. Ideally, the Commission would receive the SC’s input and this would be effectively reflected in the CMMs.
58. The Scientific Committee strives for consensus in decisions related to its scientific activities and recommendations to the Commission. Disagreements among Members have been addressed by contracting an external reviewer, making computer code readily available, or deferring to an appropriate SWG for further discussion and recommendations. If there are disagreements while adopting the SC reports, Members’ specific views are included in the report.

3.2.2. Review Panel’s recommendation relating to the quality and provision of scientific advice

Recommendation 3.2.1. The SC should provide the Commission meeting with annual summaries of the status of the stocks and these should be made public.

⁵⁶ NPFC-2019-WS BRP_HCR_MSE01-Final Report, at para 27 (d).

⁵⁷ NPFC-2019-WS BRP_HCR_MSE01-Final Report, at para 27 (a).

⁵⁸ SSC04 Final Report, para 33.

⁵⁹ TCC Final Report, para 8.

⁶⁰ NPFC-2021-COM06-WP05 Rev. 1.

⁶¹ CMM 2021-08, para 15; COM06 Final Report, para 52.

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Recommendation 3.2.2. The Commission should commit to a schedule for the development of full MSE, including MPs and HCRs for all priority stocks.

Recommendation 3.2.3. If it occurs, the SC should communicate to the Commission the reasons for lack of consensus within the SC together with an identification of research needs to bridge gaps in the scientific understanding.

3.3. Long-term planning and research

59. Article 10(4)(a) of the NPFC Convention provides that the SC will “recommend to the Commission a research plan including specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs”. Work on a SC work plan commenced during the preparatory conference phase.
60. The SC has established a rolling Five-Year Research Plan and Work Plan of the Scientific Committee, the latest version of which was adopted in December 2020 for the period 2021-2025.⁶² The proposed priority research areas are:⁶³
 1. Stock assessments for target fisheries and bycatch species.
 2. Ecosystem approach to fisheries management.
 3. Data collection, management and security.
61. The Five-Year Research Plan identifies the objectives and the areas of work to be achieved in each of these areas. It is accompanied by a comprehensive Work Plan which is reviewed and updated on an annual basis.
62. Cooperation with other organizations is recognized by the Commission as an important component of its functions. A Five-year Work Plan (2021–2025) has been developed to implement the Memorandum of Cooperation between NPFC and NPAFC, which includes specific cooperative activities for the SC.⁶⁴ There is also some bottom fisheries/VME collaboration with FAO, including a joint FAO-NPFC Workshop held in 2018. In addition, the SC has an agreed program of scientific projects to assist the SC and its subsidiary bodies in progressing the work plan.⁶⁵

3.3.1. Review Panel’s findings relating to long-term planning and research

63. The 2019 review⁶⁶ of BRPs is valuable for providing relevant background on assessment approaches in addition to ways forward on MSE work. The SC’s Five-Year planning document covers actions undertaken by SSC’s and other bodies.

⁶² SC06 Final Report, Annex Q, pp. 201-231.

⁶³ The First Five-Year Plan 2017-2021 was adopted in 2017 and had four priority areas: the three currently identified, and the addition of VMEs.

⁶⁴ SC06 Final Report, Annex P, pp. 197-200.

⁶⁵ SC06 Final Report, Annex O, pp. 192-196.

⁶⁶ Lawrence Kell, *Review of Target and Limit Reference Points*, Consultancy Report, NPFC-2019-WS BRP_HCR_MSE01-WP01 (Rev. 1).

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3.3.2. Review Panel's recommendation on long-term planning and research

Recommendation 3.3.1. The SC should annually summarize progress taken towards each element in the Five-Year Work Plan.

3.4. Best available science

64. Members have discussed the provision of raw and aggregated data and considered how it may relate to the best available science. This was noted to impact cooperative programs where data sensitivities may prohibit broad distributions of fine scale data. Some responses to the Review Panel's questionnaire noted that cooperation with expertise from outside the NPFC community (e.g., PICES) was worthwhile. Other responses noted that funding and support for science was limited and better support is required for the SC's activities to improve the best available scientific advice.

3.4.1. Review Panel's findings relating to "best available science"

65. In defining "best available" the Review Panel followed the general guidelines that include consideration of the objectives of the science.⁶⁷ Among the attributes outlined in this paper we considered the most relevant to NPFC as a) having standardized methods for collecting data; b) applying sound logic and statistical rigor for interpreting results; c) having clear documentation of methods applied (including results and conclusions); and d), supporting adequate peer review. Some respondents to the questionnaire noted the lack of independent review for stock assessments. The Review Panel notes that for the key priority species, the standards for science have generally been highlighted and where deficient, the Work Plan tends to target those deficiencies.
66. With respect to non-directed fisheries considerations, specifically judging SAI on VMEs, the standards for best science depends on qualitative aspects of these determinations (as opposed to standard fishery-management related goals of, e.g., MSY). This causes a problem between what is "significant" in the face of scientific measures that are, by their nature, highly uncertain.

3.4.2. Review Panel's recommendation on "best available science"

Recommendation 3.4.1. That the SC develop guidelines for providing advice to the Commission that reflects standards of 'best available science': specifically, whether advice passes defensible tests against identified criteria for 'best available science' (data, statistical rigor, documentation, and peer review).

Recommendation 3.4.2. That the SC pursue independent reviews of scientific advice to a greater extent.

Recommendation 3.4.3. The Commission should develop a regional observer program to contribute to addressing science demands, resolve data gaps, improve data collection on bycatch, and monitor the implementation of measures.

Recommendation 3.4.4. The Commission should develop a program of work to examine the feasibility of introducing electronic monitoring (EM) in the NPFC Convention Area.

⁶⁷ [Defining and Implementing Best Available Science for Fisheries and Environmental Science, Policy, and Management.](#)

Recommendation 3.4.5. The Commission should endeavour to engage available expertise in science issues available to other institutions and organizations (such as PICES) and seek to foster collaboration on cooperative research projects.

4. Conservation and management

4.1. Conservation and Management Measures

4.1.1. Introduction

67. The objective of the NPF Convention is to ensure the long-term conservation and sustainable use of the fisheries resources in the high seas of the North Pacific while protecting the marine ecosystems where these resources occur.⁶⁸ The Convention is designed to address fisheries resources in the high seas of the North Pacific Ocean not covered under pre-existing international fisheries management instruments. “Fishery resources” are defined to include fish, molluscs, crustaceans, and other marine species, but excludes some sedentary species (e.g., corals), catadromous species (e.g., eels), marine mammals, marine reptiles and seabirds or other marine species already covered under other instruments (e.g., tuna).⁶⁹
68. General Principles which give effect to the Objective are elaborated in Article 3. They provide, *inter alia*, for Parties, individually or collectively, to promote optimum utilization and ensure long-term sustainability of fisheries resources,⁷⁰ adopt measures, consistent with the precautionary approach and an ecosystem approach to fisheries based on the best scientific information available,⁷¹ assess the impacts of fishing activities on species belonging to the same ecosystem or dependent upon or associated with the target stocks,⁷² protect biodiversity including by preventing SAIs on VMEs,⁷³ prevent or eliminate overfishing and excess fishing capacity,⁷⁴ ensure complete and accurate data concerning fishing activities, including with respect to all target and non-target species and that such data are collected and shared,⁷⁵ ensure that any expansion of fishing effort, development of new or exploratory fisheries, or change in the gear used for existing fisheries, does not proceed without prior assessment of the impacts,⁷⁶ ensure that CMMs on the high seas and those for areas under national jurisdiction are compatible,⁷⁷ ensure compliance with CMMs and that sanctions applicable in respect of violations are adequate in severity,⁷⁸ and minimize pollution and waste, discards, catch by lost or abandoned gear, and impacts on other species and marine ecosystems.⁷⁹

⁶⁸ Convention, Article 2.

⁶⁹ Convention, Article 1(h).

⁷⁰ Convention, Article 3(a).

⁷¹ Convention, Article 3(b and c).

⁷² Convention, Article 3(d).

⁷³ Convention, Article 3(e).

⁷⁴ Convention, Article 3(f).

⁷⁵ Convention, Article 3(g).

⁷⁶ Convention, Article 3(h).

⁷⁷ Convention, Article 3(i).

⁷⁸ Convention, Article 3(j).

⁷⁹ Convention, Article 3(k).

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69. At its first meeting in 2015 the Commission agreed that the Executive Secretary, based on consultations with Members, would circulate a draft priority list of species for final approval of the Commission at its 2016 Session.⁸⁰ Based on the Secretariat advice, the Commission agreed in 2016 to the following priority species:⁸¹
- North Pacific armorhead (*Pseudopentaceros wheeleri*)
 - Splendid alfonsino (*Beryx splendens*)
 - Pacific saury (*Coloabis saira*)
 - Neon flying squid (*Ommastrephes bartammii*)
 - Japanese flying squid (*Tadarodes pacificus*)
 - Chub mackerel (*Scomber japonicus*)
 - Blue (Spotted) mackerel (*Scomber australasicus*)
 - Japanese sardine (*Sardinops melanostrictus*).
70. Guided by the list of eight priority species, the NPFC adopted its first CMM for Pacific saury in 2015. Subsequently, a CMM relating to bottom fishing in the Northwest Pacific was adopted in 2016 at the Commission’s second session. A new CMM relating to bottom fishing in the Northeast Pacific and a CMM concerning Chub mackerel were adopted at its session in 2017. In 2019 a single measure for Japanese flying squid and Japanese sardine was adopted. The CMM for Japanese flying squid and Japanese sardine was revised at the next session of the Commission in 2021 to include Neon flying squid. The two CMMs concerning Pacific saury and bottom fishing in the Northwest Pacific have been revised at each annual session of the Commission since their adoption. This was also the case for the CMMs for bottom fishing in the Northeast Pacific and Chub mackerel until the 2021 session of the Commission when no revisions were adopted. The Commission has also published information for other North Pacific fishery resources including Sablefish (*Anoplopoma fimbria*), which is also the subject of a CMM⁸². Two species of rockfish (*Sebastes melanostictus* and *S. aleutianus*) have also been profiled and are referenced in CMMs concerned with bottom fishing and Sablefish.⁸³ North Pacific armorhead and Splendid alfonsino are included in the CMM concerned with bottom fishing in the Northwest Pacific (CMM 2021-05 and its predecessors). The Measures and decisions of the Commission are consolidated in the “NPFC Conservation and Sustainable Use Handbook”⁸⁴, which is available on the Commission’s website.⁸⁵
71. The following sections describe the CMMs adopted as interim measures prior to the establishment of the NPFC, and the Measures that NPFC has adopted for particular stocks following its establishment. These sections show how new Measures were progressively adopted for priority stocks, and how the Measures evolved over the years through successive revisions which generally sought to strengthen existing Measures. This factual and descriptive section is followed by a section which contains the Review Panel’s assessment of these CMMs.

⁸⁰ COM01, para. 7.

⁸¹ COM02, para 38.

⁸² CMM 2019-10.

⁸³ See SC06 Final Report, Annex G.

⁸⁴ Current to July 2021.

⁸⁵ <https://www.npfc.int/system/files/2021-05/Sustainable%20Use%20and%20Conservation%20Handbook.pdf>

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4.1.2. Conservation and management decisions prior to the establishment of NPFC

72. In the years leading to the establishment of NPFC, the participants in the Inter-Governmental Meetings on the Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean agreed to decisions addressing the impacts of bottom fishing. On the advice provided by the 4th meeting of the Scientific Working Group (SWG4), the Fifth Inter-Governmental Meeting held in December 2008 adopted “New Mechanisms for the Protection of Vulnerable Marine Ecosystems (VMEs) and Sustainable Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean”⁸⁶, the SWG’s “Review of Procedures for the Bottom Fishing Activities”⁸⁷ and “Science-based standards and criteria for identification of VMEs and assessment of SAIs on VMEs and marine species”.⁸⁸
73. At the Sixth Inter-Governmental Meeting, an “Exploratory Fishery Protocol” and consequential changes to the “New Mechanisms for Protection of VMEs and Sustainable Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean (Interim Measures)” were adopted.⁸⁹
74. Other than discussion on the extension of the “Interim Measures” to the entire North Pacific (other than FAO Area 61), “Interim Measures” did not receive further substantive discussion until the 10th Multilateral Meeting in 2011 which adopted revised “New Interim Measures for the Protection of VMEs in the Northeast Pacific Ocean” and agreed on a definition of VMEs for the purposes of the “Interim Measures in the Northeast and Northwest Pacific including the Exploratory Fishery Protocol”.⁹⁰ These Interim Measures provided the basis for future bottom fishing measures adopted by the NPFC.

4.1.3. Pacific saury

75. In 2015, the Commission adopted its first CMM for a NPFC fishery resource listed as a priority species - Pacific saury (CMM 2015-02).
76. The CMM called on Members to refrain from a rapid expansion of the number of vessels authorised to fish for Pacific saury until a stock assessment by the SSCSSC and the SC was completed in 2017. Members were encouraged to adopt compatible Measures in areas under national jurisdiction adjacent to the Convention Area. The Measure also called on those eligible to ratify the Convention that had not yet completed domestic processes to apply the Measure and encouraged engagement from CNCPs.
77. At its Third Session in 2017, paragraph 1 of the Measure for Pacific saury (CMM 2015-02) was revised into two paragraphs to require Members currently fishing for Pacific saury to “refrain from expansion”, in the Convention Area and in areas under national jurisdiction, of the number of fishing vessels entitled to fly their flags and authorized to fish for Pacific saury from the “historical existing level”.⁹¹ The original CMM required Members to “refrain from rapid expansion” of the number of vessels authorised to fish for Pacific saury in the Convention Area, from the “historical existing level”. Members fishing for Pacific saury within areas under the national jurisdiction of

⁸⁶ SWG4/NWPBF5/WP15/Rev3.

⁸⁷ SWG4/WP11/Rev.

⁸⁸ SWG4/NWPBF5/WP6/rev.2; 5th Multilateral Meeting Summary Report, Section 6 and 7

⁸⁹ 6th Multilateral Meeting Summary Report, Section 6.

⁹⁰ 6th Multilateral Meeting Summary Report, Section 4.

⁹¹ CMM 2017-08, paras. 1 and 2.

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other Members were requested to take compatible measures.⁹² In addition to removing paragraphs 4 and 5 from CMM 2015-02, a new para. 5 was inserted to support the on-going stock assessment work of the SSC and SC so that further scientific advice could be provided to the 2018 Session of the Commission. CMM 2017-08 also included a new paragraph relating to the development of fisheries for Pacific saury for those Members not currently engaged in the fishery.⁹³

78. At its fourth session in 2018, the Measure for Pacific saury (CMM 2017-08) was revised to include three additional paragraphs.⁹⁴ Paragraph 4 related to the development of new fishing activity for Pacific saury in the Convention Area by Members without documented historical catch. Paragraph 6 provided for the retention of all catch of Pacific saury and paragraph 7 encouraged Members to take necessary measures for vessels flying their flag to refrain from fishing in areas where juvenile fish contribute more than 50% of the Pacific saury catch.⁹⁵
79. At the 2019 annual session, the pre-ambular paragraphs of CMM 2018-08 for Pacific saury were revised to update the Measure. The updates were based on the work of the SSC on Pacific saury relating to the completion of a consensus stock assessment and to encourage the Commission to consider additional management measures to avoid an increasing trend in the Pacific saury exploitation rate. The new Measure (CMM 2019-08) included three sections relating to effort management, catch management and other measures. The effort management section incorporated the first three operative paragraphs of CMM 2018-08 unchanged.
80. Seven new paragraphs were incorporated in CMM 2019-08 (new paragraphs 4-10 inclusive). Paragraph 4 provided that the total catch of Pacific saury from the Convention Area and areas under national jurisdiction was not to exceed 556,250 mt⁹⁶. The total catch for 2020 for the Convention Area was set at 330,000mt. Members were required to ensure that the total catch of Pacific saury by vessels flying their flag would not exceed the reported catch in 2018 with the expectation the combined catch from the Convention Area would not exceed 330,000mt. Paragraph 8 established weekly reporting with the Secretariat required to publish compiled catches on the Commission's website "without delay". Paragraph 9 provided for Members to transfer part of their catch from areas under national jurisdiction adjacent to the Convention Area to the catch of Pacific saury in the Convention Area by their flagged vessels. The Commission, based on advice provided by the SC, was to review the provisions of paragraphs 4 and 5 relating to total catch in 2020 and "afterwards". Paragraphs 4-8 inclusive of CMM 2018-08 became paragraphs 11-15 of CMM 2019-08. Paragraph 9, which encouraged CNCPs to maintain their CNCP status, was removed in CMM 2019-08 and a new paragraph 16 provided that CMM 2019-08 "shall in no case be a basis for a future CMM for Pacific saury".⁹⁷
81. The Pacific saury Measure (CMM 2019-08) was again revised in 2021. Paragraph 4 was revised to record a new total allowable catch for the Convention Area for 2021 and 2022 of 333,750 mt, a

⁹² CMM 2015-02, para. 2.

⁹³ CMM 2017-08, para 6.

⁹⁴ CMM 2018-08, paras 4, 6 and 7.

⁹⁵ As Pacific saury lives only for two years, age 0 fish are regarded as "juveniles".

⁹⁶ The Review Panel notes that some CMMs use "tons" others use "metric tonnes".

⁹⁷ The Review Panel interprets that this statement relates to para 52 of the COM06 Report where some Members expressed concern that the TAC agreed to for Pacific saury exceeds F_{msy} determined by the joint SSC PSSA. As well, Members noted their commitment to advance an MSE process for Pacific saury, given the urgent need for effective management of the stock.

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decrease of 40% on the previous total catch⁹⁸. The catch in the Convention Area was reduced to 198,000mt.⁹⁹ To ensure that the catch in the Convention Area would not exceed 198,000mt, Members were required to reduce the catch of their flagged fishing vessels in 2021 and 2022 by 40%.¹⁰⁰ Paragraph 8 established weekly reporting with the Secretariat required to publish compiled catches on the Commission's website "without delay". The Executive Secretary was required to inform Members when the catch of a Members' flagged vessels reached 70% of its catch limit set.¹⁰¹ A Member was required to close the fishery for its flagged vessels when the total catch of its flagged vessels was equivalent to 100% of its catch limit. Members were required to notify the Executive Secretary of the date of the closure, except as described in paragraph 9, which enabled Members to transfer part of their catch for areas under national jurisdiction adjacent to the Convention Area to the catch of Pacific saury in the Convention Area by their flagged vessels.

4.1.4. Bottom fishing and protection of VMEs

82. Building on the work undertaken between 2008 and 2015 through the preparatory discussions, at its second session in 2016, the Commission adopted, *inter alia*, two Measures focussed on monitoring and mitigating the impacts of bottom fishing on VMEs; one applying in the north-west Pacific (CMM 2016-05) and the other applying in the north-east Pacific (CMM 2016-06). The objective of these Measures was "to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur". They were designed to prevent SAIs of fishing interactions with VMEs in the North Pacific Ocean, acknowledging the complex dependency of fishing resources and species belonging to the same ecosystem as VMEs. The Measures established that fishing effort in bottom fisheries¹⁰² in the western and eastern parts of the Convention Area would be limited to the level of a historical average¹⁰³ in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems, and would be dependent on new SC advice. The Measures also provide that Members would only authorize fishing activities on the basis of the assessments, comments and recommendations from the SC adopted by the Commission.¹⁰⁴ In addition, if it was determined that the fishing activity or operations of the vessel or vessels in question would have a SAI on VMEs, the Commission would adopt CMMs to prevent such impacts on the basis of advice and recommendations of the SC.¹⁰⁵ CMM 2016-05 provided that, *inter alia*, Members would ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm.¹⁰⁶

⁹⁸ The Review Panel notes that the annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) exceeds the TAC that would apply if it was based on the F_{MSY} catch ($B_{2021} * F_{MSY} = 192,804$ tons) and the current biomass is much lower than B_{MSY} . Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury. In December 2021 at its sixth session, the SC endorsed the advice from the SSC PS that the TAC or fishing effort be reduced to support the long-term sustainable use of Pacific saury (SC06 Final Report, para 13(f)(i)). However, the Commission has not met since SC06.

⁹⁹ CMM 2019-08, para. 5.

¹⁰⁰ CMM 2019-08, para. 6.

¹⁰¹ CMM 2019-08, para. 6.

¹⁰² Primarily targeting North Pacific armorhead and Splendid alfonsino.

¹⁰³ Baseline to be determined through consensus in the SC based on information to be provided by Members.

¹⁰⁴ CMM 2016-05 and 2016-06, para. 3(e) and (f).

¹⁰⁵ CMM 2016-05 and 2016-06, para. 3(d).

¹⁰⁶ CMM 2016-05, para. I.

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Encounters of more than 50kg of VMEs in a single trawl were to be reported to the Secretariat and, following such encounters, vessels were required to re-locate at least 2 nm from the encounter.¹⁰⁷

83. Annex 5 of CMM 2016-05 establishes a scientific observer program for NPFC bottom fisheries. It is replicated in CMM 2016-06. The Measures provide for data to be collected from a range of gear types including trawl, bottom longline and bottom gillnet. The Measure does not refer to other gears deployed in NPFC fisheries nor to any compliance-related functions under the program. Paragraph G of Annex 5 provides, among other requirements, that flag State members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers. Data to be collected through such monitoring is described. Similarly, paragraph H directs the SC to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a VME. Information submission requirements, at least one month in advance of the [*sic. next*] SC meeting, are also described.¹⁰⁸
84. In addition, in respect of vessels flying its flag, Members were required to, *inter alia*, conduct the assessments called for in paragraph 83(a) of UNGA Resolution 61/105, in a manner consistent with the “FAO Guidelines and the Standards and Criteria” included in Annex 2 of both Measures and submit those assessments to the SC for advice and recommendations regarding the suitability of the operations of the vessel or vessels in question.¹⁰⁹
85. At its Third Session in 2017, the Commission approved some minor revisions to CMM 2016-05 concerning bottom fishing by providing a more precise description of areas on the C-H seamount and South-eastern part of Koko seamount closed for precautionary reasons.¹¹⁰ A minor revision was also agreed to CMM 2016-06 where the determination regarding the limitation of fishing effort was revised subject to consensus in the SC “based on information to be provided by Members” which was not provided for in the initial Measure.¹¹¹
86. The Commission revised CMM 2017-05 relating to bottom fisheries in the north-west Pacific at its fourth session in 2018. The revisions involved the addition of six additional paragraphs specific to North Pacific armorhead and Splendid alfonsino fished by Members in the Convention Area.¹¹² The additional paragraphs described obligations for Members without a documented catch history developing new fishing activity. They also provided for the determination of the total catch based on recruitment assessments with Japan encouraged to limit its catch to 500t in years of low recruitment and Korea to limit its catch to 200t with provisions for managing catches more than those limits. In years of strong recruitment, Japan and Korea were encouraged to limit their respective catches to 10,000t and 2,000t. The Measure did not preclude other Members with a historical catch participating in the fishery. Specific areas of the Emperor seamounts, where half of the catch were recorded in 2010 and 2012, were excluded from the fishery and a mesh regulation

¹⁰⁷ CMM 2016-05, para. 4G and CMM 2016-06, para. 3(j).

¹⁰⁸ CMM 2016-05, para. 6 and 9 and CMM 2016-06, para. 8 and 9.

¹⁰⁹ CMM 2016-05, para. 5 and CMM 2016-06, para 3.

¹¹⁰ CMM 2016-05, para. H.

¹¹¹ CMM 2016-05, para. 3(i).

¹¹² CMM 2018-05, para. L to Q inclusive.

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was introduced.¹¹³ Two new Annexes were included to describe a monitoring plan for the detection of strong recruitment for North Pacific armorhead.¹¹⁴

87. At its 2019 Session, the Commission revised CMM 2018-05 (adopted as CMM 2019-06). A new paragraph was inserted to explain the treatment of catches taken during monitoring surveys with respect to the limits.¹¹⁵ The two sub-annexes of Annex 6 were revised and combined in a single Annex to describe monitoring arrangements for Pacific armorhead under a heading of “adaptive management”.¹¹⁶ CMM 2018-06 was not revised but was adopted as CMM 2019-06.
88. The two key species targeted by NPFC bottom fisheries are North Pacific armorhead and Splendid alfonsino, with bycatches of Mirror dory, Butterfish, Rockfishes, Crabs and others.¹¹⁷ The SC has noted with concern the decreasing trends and apparent poor status of the North Pacific armorhead stock, particularly as catch rates of North Pacific armorhead decline, fishing effort is transferred to Splendid alfonsino the status of which is also of increasing concern to scientists.¹¹⁸
89. In 2021, CMM 2019-06 was revised to stipulate that fishing vessel trawl gear is prohibited from contacting the sea floor at two sites with VME indicator species. A Member of the Commission whose fishing vessels enter the two areas identified are required to report to the TCC as to how it ensured the compliance of the Measure.¹¹⁹

4.1.5. Chub mackerel

90. At its 2016 Session, the Commission adopted an additional CMM for a priority fishery resource: Chub mackerel. CMM 2016-07 encouraged Members and CNCs to refrain from expansion of the number of fishing vessels entitled to fly their flags and authorized to fish for Chub mackerel in the Convention area, based on the number of vessels from the historical existing level, until the stock assessment by the SC was completed. Members participating in Chub mackerel fisheries in areas under national jurisdiction adjacent to the Convention area were requested to take compatible measures.
91. At its Third Session in 2017, the Commission revised CMM 2016-07 to include new pre-ambular paragraphs, which noted progress towards a stock assessment for Chub mackerel by the SC and expressed concern that the requirement in Article 3 of the Convention that expansion of fishing effort not proceed in the absence of an assessment was not preventing a rapid increase in fishing effort for Chub mackerel in the Convention Area.¹²⁰ Paragraph 1 of CMM 2016-07 was revised to target Members and CNCs with “substantial” harvests of Chub mackerel to refrain from expanding the number of their vessels authorised to fish for Chub mackerel based on the “historical existing level” until the SC had completed its stock assessment. A new paragraph 2 was inserted to encourage Members and CNCs “without substantial” harvests of Chub mackerel to apply similar constraints. Paragraphs 4, 5 and 6 of CMM 2016-07 were deleted and four new paragraphs were inserted relating to the provision of data, sharing information, the schedule for completion of

¹¹³ CMM 2018-05, para. P.

¹¹⁴ CMM 2018-05, Annex 6-1 and 6-2.

¹¹⁵ CMM 2019-05, para. O.

¹¹⁶ CMM 2019-06, Annex 6.

¹¹⁷ Refer to SSC NPA2 Final Report, 2017.

¹¹⁸ SC06 Final Report, Annex E.

¹¹⁹ CMM 2021-05, para. S.

¹²⁰ Incorporated into CMM 2017-07.

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the stock assessment and provisions for Members not harvesting substantial amounts of Chub mackerel to develop their own Chub mackerel fisheries.¹²¹

92. At its fourth session in 2018, CMM 2017-07 was revised again.¹²² The revision provided for the addition of a new paragraph relating to the development of new fishing activity for Chub mackerel in the Convention Area by Members without documented historical catch.¹²³ The remainder of the Measure was unchanged.
93. CMM 2018-07 was revised as CMM 2019-07 at the Commission's fifth session in 2019. The revisions included the addition of three pre-ambular paragraphs that reaffirmed the commitment of Members to establishing measures for the conservation of straddling stocks in the adjacent high seas consistent with the UN Fish Stocks Agreement and to acknowledge the principle of compatibility between Measures established for stocks on the high seas and in areas under national jurisdiction. Paragraph 3 was expanded to provide for the transfer of part of the catch by Members within national jurisdiction to the catch of Chub mackerel in the Convention Area by their flagged vessels subject to i) a catch limit having been established for Chub mackerel within its jurisdiction, ii) that catch limit had been notified to the Commission, and iii) the total catch within areas under national jurisdiction and in the Convention Area do not exceed the Member's total allocation for its jurisdiction.

4.1.6. Japanese sardine, Japanese flying squid and Neon flying squid

94. At its fifth session in 2019, the Commission adopted a new Measure for two species identified as priority species by the Commission in 2016 – Japanese sardine and Japanese flying squid (CMM 2019-11). Noting eight priority species had been identified by the Commission, and that Measures had already been adopted for Pacific saury and Chub mackerel, with the adoption of these two Measures, the two priority species that remained to be addressed in a CMM were Blue (Spotted) mackerel and Neon flying squid.
95. CMM 2019-11 encourages Members and CNCPs to refrain from expansion of the number of their fishing vessels authorised to fish for Japanese sardine and Japanese flying squid in the Convention Area from historical existing levels.¹²⁴ Members are encouraged to establish compatible measures in areas under national jurisdiction adjacent to the Convention Area.¹²⁵ Drawing on the provisions of CMM 2019-07 for Chub mackerel, CMM 2019-11 also provides for the transfer of part of a Member's catch limit for areas under national jurisdiction to the catch of the two species in the Convention Area by their flagged vessels subject to i) a catch limit having been established for the species in its jurisdiction, ii) that catch limit has been notified to the Commission, and iii) the total catch within areas under national jurisdiction and in the Convention Area do not exceed the Member's total allocation for its jurisdiction. Paragraph 4 describes arrangements for new fishing activity for the two species. Provisions for VMS, data submission obligations and cooperation regarding the sharing of information to eliminate IUU fishing for these species were added.¹²⁶ Paragraph 8 provides for the Measure to be revised by the Commission following a stock

¹²¹ CMM 2017-07, Paras 5, 6, 7 and 8.

¹²² CMM 2018-07.

¹²³ CMM 2018-07, Para. 4.

¹²⁴ CMM 2019-11, paras 1 and 2.

¹²⁵ CMM 2019-11, para 3.

¹²⁶ CMM 2019-11, paras 5, 6 and 7.

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assessment for either of the two species. It also provides that, those Members not harvesting “substantial” amounts of the two species in the Convention Area will not be hindered in developing their own fisheries. The term of the Measure was unspecified but was subject to decisions in the Commission based on the advice of the SC.

96. The Measure for Japanese sardine and Japanese flying squid was revised in 2021 at the Commission’s sixth session to include Neon flying squid (CMM 2021-11). All of the revisions to the operative paragraphs in CMM 2019-11 simply reflected the expansion of the Measure to cover three pelagic species as opposed to two in the previous version of the Measure (CMM 2019-11).
97. The Review Panel notes that there is significant fishing effort on Neon flying squid. Although there are effort limitations for Japanese flying squid, the authorizations to fish are not separated by species of squid in the NPFC’s vessel registry.
98. In November 2020, the SC formed four new SWGs to focus on exchanging information and collating available data on Neon flying squid, Japanese flying squid, Japanese sardine, and Blue (Spotted) mackerel as the foundation for developing stock assessments of these priority species.¹²⁷

4.1.7. *Sablefish*

99. At its 2019 Session, the Commission adopted a new Measure for Sablefish (CMM 2019-10).¹²⁸ Sablefish is only fished by Canada in the Convention Area using longline and longline trap gear.¹²⁹ The first five operative paragraphs of CMM 2019-10 describe obligations on Members currently harvesting Sablefish, Members with a historical catch but no current harvest, development of new fishing activity in the eastern part of the Convention Area and in areas under national jurisdiction adjacent to the Convention Area. The Measure includes the provisions of CMM 2019-06 relating to VMS and provides that vessels fishing for Sablefish will carry 100% observer coverage.¹³⁰ It does not preclude the prospect of developing new and exploratory fisheries for Sablefish in the eastern part of the Convention Area.¹³¹ It also encourages Members to report lost fishing gear as soon as possible to the Secretariat and to make efforts to retrieve lost gear.¹³²

4.1.8. *The Review Panel’s assessment of Conservation and Management Measures*

100. This review of the development of conservation and management measures illustrates the work that was done prior to and after the establishment of NPFC to develop and strengthen Measures for NPFC fishery resources. It highlights that the focus of the work of the Commission has been on adopting, and periodically revising, CMMs primarily concerned with priority fishery resources.
101. An overarching comment relating to the Measures adopted for priority fishery resources concerns the lack of a verifiable objective for each Measure. For example, the stated objective of CMM 2016-05 and CMM 2016-06 on bottom fishing, retained in subsequent iterations, is “to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur”.

¹²⁷ SC05 Final Report, para 30.

¹²⁸ COMM05, paras 35, 36 and Annex T.

¹²⁹ NPFC-2019-COM05-WP07 (Rev 8).

¹³⁰ CMM 2019-10, para 8.

¹³¹ CMM 2019-10, para 5.

¹³² CMM 2019-10, para 9.

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While the aspiration is noble, it is beyond the capability of a multilateral arrangement in such a dynamic physical and political environment that prevails in North Pacific fisheries to achieve this objective. Further, “protection” is poorly defined which affects the effectiveness of the Measures. It is important that performance measures and trade-offs are evaluated to transparently support decisions that are made. In the context of these two Measures, marine ecosystems specifically refer to VMEs. However, despite the provisions of Article 10(4)(e) of the Convention relating to the development of processes to identify VMEs, and of Annex 5 (para. G) of both bottom fishing Measures, NPFC has not yet adopted a quantitative methodology for identifying VMEs.¹³³

102. Both bottom fishing CMMs also provide that, if it was determined that fishing activity would have a SAI on VMEs, the Commission would adopt CMMs to prevent such impacts based on advice and recommendations of the SC. In this regard, revisions to the original CMMs include a requirement that Members will ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm, that encounters of more than 50kg of VMEs in a single trawl are reported to the Secretariat and, following such encounters, vessels are required to re-locate at least 2 nm from the encounter. It is not evident that the footrope distance to the seafloor is assessed for compliance nor that the Secretariat has ever received a report of an encounter of more than 50kg.¹³⁴
103. In addition, Members are required by Annex 2 of both Measures to conduct the assessments called for in paragraph 83(a) of UNGA Resolution 61/105, in a manner consistent with the “FAO Guidelines and the Standards and Criteria” and submit those assessments to the SC for advice and recommendations regarding the suitability of the operations of fishing vessels. There is no evidence that this has ever been formally undertaken. These types of issues bring into question the capacity of NPFC to monitor compliance with obligations it establishes for itself and whether adopted Measures are effective in addressing the issue they were designed to target.
104. The Review Panel assesses that NPFC has not yet adopted Measures for non-target species that ensures long-term conservation and sustainable use of the fisheries resources based on the best scientific evidence available, which is one of the key criteria to be assessed as part of the Performance Review. The review of existing CMMs identified some potentially significant challenges associated with interpretation of terms used and, in association with the lack of clarity with some of the drafting, creates potential challenges with both the implementation and an assessment of the efficacy of existing Measures.
105. In relation to NPFC Measures generally, the lack of an agreed metric for fishing effort or fishing capacity is problematic. The bottom fishing Measures establish that fishing effort in bottom fisheries would be limited to the level of a historical average (baseline to be determined through consensus in the SC based on information to be provided by Members) in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems, and would be dependent on new SC advice. As noted at TCC04, the current definition of “effort” based only on the number of authorized fishing vessels, or number of active vessels, are not efficient means to assess and monitor fishing mortality on

¹³³ The Review Panel understands that Canada is actively working on developing a quantitative method that could be applied throughout the Convention Area with the goal of applying it in the NE Pacific during the coming years.

¹³⁴ In 2021, CMM 2019-06 was revised to stipulate that fishing vessel trawl gear is prohibited from contacting the sea floor at two sites with VME indicator species. A Member of the Commission whose fishing vessels enter the two areas identified are required to report to the TCC as to how it ensured the compliance of the Measure.

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stocks¹³⁵. This remains a critical issue for the TCC, SC and Commission to address (as discussed further in Section 4.3).

106. NPFC CMMs commonly use terms that open the possibility for subjective interpretation. While perhaps politically necessary to achieve consensus at the time of adoption, the lack of definition of terms used creates significant challenges for the Commission in terms of assessing the efficacy of its decisions. As an example, CMM 2016-07 (para 1) was revised to target Members and CNCs with “substantial” harvests of Chub mackerel to refrain from expanding the number of their vessels authorised to fish for Chub mackerel based on the “historical existing level” until the SC had completed its stock assessment. Among other revisions, a new paragraph 2 was inserted to encourage Members and CNCs “without substantial” harvests of Chub mackerel to apply similar constraints. Neither “substantial” nor “without substantial” have been defined for NPFC application. A similar issue arises in CMM 2021-11 in which Members and CNCs are encouraged to refrain from expansion of the number of their fishing vessels authorised to fish for Japanese sardine, Neon flying squid and Japanese flying squid in the Convention Area from “historical existing levels”, a term that is also undefined in the context of these CMMs.
107. Annex 5 of CMM 2016-05 and CMM 2016-06 establishes a scientific observer program for NPFC bottom fisheries. It is appropriate that a variety of initiatives were consolidated in a single Measure in the early years of NPFC when the focus was on responding to the UN Resolutions relating to bottom fishing and protecting VMEs. However, as the complexity and detail of management and conservation decisions of the Commission continue to evolve, improved clarity would be achieved by separating some of the annexes that continue to be supported in the two bottom fishing CMMs and adopt them as either i) standalone CMMs, or ii) as policies or guidelines. Candidates for consideration include the “Exploratory Fishery Protocol”, the “Science-based standards and criteria for identification of VMEs and assessment of SAIs on VMEs and marine species” and the “Scientific Observer Program”. Successful completion of this exercise would streamline review and refinement of the substantive CMM itself. In addition, in relation to the Scientific Observer Program, it would provide a sound foundation for eventual extension of the observer program to all NPFC fisheries (see Section 5.2.2 for additional discussion).
108. Another significant issue for RFMOs responsible for straddling stocks and highly migratory stocks that spend periods in areas under national jurisdiction concerns the compatibility between Measures established in the Convention Area on the high seas and related Measures established by Members in areas under their national jurisdiction. This is a significant feature of NPFC fisheries including for Pacific saury, Japanese sardine, mackerels and squids.
109. NPFC’s Chub mackerel CMM (CMM 2018-07) was revised as CMM 2019-07 in 2019 by including three pre-ambular paragraphs that reaffirmed the commitment of Members to acknowledge the principle of compatibility between measures established for stocks on the high seas and in areas under national jurisdiction. Paragraph 3 was expanded to provide for the transfer of part of the catch by Members within national jurisdiction to the catch of Chub mackerel in the Convention Area by their flagged vessels subject to i) a catch limit having been established for Chub mackerel within its jurisdiction, ii) that catch limit had been notified to the Commission, and iii) the total catch within areas under national jurisdiction and in the Convention Area do not exceed the Member’s total allocation for its jurisdiction. It is not evident how compatibility in this

¹³⁵ TCC04 Final Report, paras 16-18.

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regard is evaluated in NPFC fisheries. NPFC is yet to established procedures to monitor and report on compliance with these provisions.

110. The Review Panel notes that, at its fifth session in 2019, the Commission adopted an additional new Measure for Japanese sardine and Japanese flying squid (CMM 2019-11). This Measure was revised in 2021 to include Neon flying squid (CMM 2021-11). While the difficulties associated with monitoring multi-species fisheries are acknowledged, and similar challenges are encountered in North Pacific mackerel fisheries, unless the catch and effort by gear type is adequately characterised, it is extremely difficult to assess the benefit to individual species when management and conservation arrangements apply equally to multiple species. The Review Panel is of the view that NPFC should strive to establish CMMs that are dedicated to a single species. (See Section 4.2 relating to data required to improve the characterisation of NPFC fisheries).

4.1.9. The Review Panel's findings

111. The Review Panel notes:
- a) the considerable work undertaken since 2008 under the auspices of the SWG, the Inter-Governmental Meetings and continued after 2015 in the Commission and Scientific Committee to formally establish arrangements for the conservation and management of NPFC priority fishery resources,
 - b) the on-going uncertain status of many NPFC fishery resources, the apparent unsustainability of current levels of fishing mortality on these stocks and the actions that have been recently introduced in an effort to achieve sustainable levels of fishing mortality,
 - c) that North Pacific armorhead is a biologically challenging species to undertake a stock assessment and, because efforts by the SC have not been successful to date, the Commission has adopted an adaptive approach to managing North Pacific armorhead fisheries, and
 - d) that decisions relating to non-target and bycatch species or the impact of NPFC fisheries on associated or dependent species are restricted to demersal resources impacted during bottom fishing. CMMs concerning pelagic NPFC fishery resources make limited, or no, reference to obligations enshrined in the Convention relating to the assessment of impacts of fishing activities on species belonging to the same ecosystem or dependent upon or associated with the target stocks or the protection of biodiversity.¹³⁶

4.1.10. The Review Panel's recommendations

Recommendation 4.1.1. That the Commission and Scientific Committee increase efforts to acquire the requisite data and conclude stock assessments for all NPFC fishery resources with particular attention to the priority stocks: North Pacific armorhead, Splendid alfonsino, Pacific saury, Chub mackerel, Blue (Spotted) mackerel, Japanese sardine, Japanese flying squid and Neon flying squid. These assessments should provide the knowledge and understanding required to adopt more enduring and scientifically validated CMMs to achieve sustainable levels of fishing mortality.

¹³⁶ Convention, Article 3(d) and (e).

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Recommendation 4.1.2. That pending the results of stock assessments and where information is lacking, the Commission adopt a precautionary approach (taking account of the risk of overfishing and whether stocks are overfished) to the setting of catch limits.

Recommendation 4.1.3. That the Commission undertake a comprehensive review of existing CMMs to include verifiable objectives, address potential issues associated with interpretation by reducing the use of subjective terms and adopt baselines and measures of performance. This should be repeated regularly not less than every 5 years.

Recommendation 4.1.4. That stand alone CMMs be dedicated to a single NPFC fishery resource and that multi-species CMMs be phased out as the results of stock assessments and Management Procedures become available.

4.2. Data collection and sharing

4.2.1. Introduction

112. In assessing obligations and associated data generated from NPFC fisheries and its management the Panel reviewed the chronological development of data-related discussions in NPFC, including those recorded in the Preparatory Conference and related meetings, SC, TCC and associated developments in Secretariat's data management capacity. This review, combined with discussions with NPFC Member representatives, Secretariat staff and drawing on the responses to the Review Panel's questionnaire, provided a basis for the Panel to comment on the status of data acquisition for NPFC fisheries, identify gaps in data acquisition and comment on processes and procedures to administer NPFC data to support NPFC decision-making processes. It also provided a foundation on which to base recommendations regarding future efforts in NPFC to strengthen both the quality and timeliness of data available to support Commission decision-making.

4.2.2. Data-related provisions of the Convention

113. The preambular paragraphs of the NPFC Convention recognize the necessity of collecting scientific data to understand the marine biodiversity and ecology in the region and to assess the impacts of fisheries. Article 3 of the Convention requires that, individually or collectively, Members will ensure that complete and accurate data concerning fishing activities, including with respect to all target and non-target species within the Convention Area, are collected and shared in a timely and appropriate manner.¹³⁷
114. The functions of the SC in relation to data, described at Article 10, includes to recommend to the Commission a Research Plan which addresses specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs,¹³⁸ collect, analyse and disseminate relevant information,¹³⁹ and develop rules and standards for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area.¹⁴⁰

¹³⁷ Convention, Article 3(g)

¹³⁸ Convention, Article 10(4)(a)

¹³⁹ Convention, Article 10(4)(c)

¹⁴⁰ Convention, Article 10(4)(i)

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115. The functions of the TCC, which is described in Article 11(4), includes to develop rules and procedures governing the use of data and other information for MCS purposes.¹⁴¹ To encourage compliance, the Convention also states that any Contracting Party that does not submit the data and information required under Article 16(3) in respect of any year in which fishing occurred in the Convention Area by fishing vessels entitled to fly its flag shall not participate in the relevant fisheries until that data and information have been provided¹⁴².
116. Article 16 is dedicated to data collection, compilation and exchange. It requires the Commission to develop standards, rules and procedures for, *inter alia*, the collection, verification and timely reporting of all relevant data by Members of the Commission,¹⁴³ the compilation and management by the Commission of accurate and complete data to facilitate effective stock assessment for ensuring that the provision of the best scientific advice is enabled,¹⁴⁴ data exchange and sharing arrangements,¹⁴⁵ including between RFMOs and arrangements,¹⁴⁶ audits of Commission Members' compliance with data collection and exchange requirements, and for addressing any non-compliance identified in such audits.¹⁴⁷
117. The Convention also provides that the Commission will ensure, *inter alia*, that data concerning the number of fishing vessels operating in the Convention Area are publicly available.¹⁴⁸ In addition, the Commission is required to establish rules to ensure the security of, access to and dissemination of data, including data reported via real-time satellite position-fixing transmitters, while maintaining confidentiality where appropriate and taking due account of the domestic practices of Members of the Commission.¹⁴⁹

4.2.3. Data-related institutional history and responsibilities

118. Data, and data deficiencies, have received significant consideration by NPFC Members since informal consultations to establish the organization commenced in 2006.
119. The predecessor to the NPFC SC, the Scientific Working Group (SWG), which convened 13 meetings from 2007 to 2015, started these discussions. The SC and its SSCs and SWGs all require quality-assured data and information.¹⁵⁰ They assimilate scientific and fishery dependent and independent information and data and collectively share this information to support stock assessments and assess fishery impacts on ecosystems as input into policy and management decisions.
120. The SC has produced three Research Plans since 2015. One applied for the period 2014-2017, one for the period 2018-2021 and the current Plan (2021-2025).¹⁵¹ All three describe actions relating to data and efforts to address data gaps.

¹⁴¹ Convention, Article 11(4)(f).

¹⁴² Convention, Article 13(11).

¹⁴³ Convention, Article 16(1)(a).

¹⁴⁴ Convention, Article 16(1)(b).

¹⁴⁵ Convention, Article 16(1)(c).

¹⁴⁶ Convention, Article 16(1)(d).

¹⁴⁷ Convention, Article 16(1)(e).

¹⁴⁸ Convention, Article 16(2)

¹⁴⁹ Convention, Article 16(4)

¹⁵⁰ These were established at SC05 in 2020: SC05 Final Report, para 30.

¹⁵¹ <https://www.npfc.int/research-and-work-plan>

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121. The TCC oversees compliance-related data. Compliance-related considerations by NPFC Members were commenced in 2013 when the Fifth Preparatory Conference established a Technical and Compliance Working Group (TCWG).¹⁵² The first report of the TCWG was considered at the Sixth Preparatory Conference in 2014.¹⁵³ It included consideration of issues such as high seas boarding and inspection, transshipment and Annual Reports for bottom fisheries. The Seventh Preparatory Conference in 2015 received a report from the second session of the TCWG which advised that information requirements for Vessel Registration had been agreed and that further work was required to finalize procedures related to transshipment and high seas boarding and inspection. Apart from consideration of data field types associated with these procedures, the TCWG did not consider systems for compliance-related data administration and management.¹⁵⁴ Since entry into force of the Convention, the work program of the TCC has also been supported by two SWG's that work intersessionally and annually report to the TCC: the SWG on Planning and Development (PD), and the SWG on Operations (Ops).
122. The Secretariat supports a Data Manager position. In addition, a Compliance Manager and a Science Manager are engaged in substantive discussion on data issues across Secretariat functions. The Secretariat has, since 2017, retained the services of a data management systems and website development company under a consultancy agreement.¹⁵⁵

4.2.4. Agreed data submission formats, specifications, and timeframes

123. This section details the chronology of the NPFC's consideration of data submission formats, specifications, and timeframes. It is followed by the Review Panel's assessment, based on the Performance Review's criteria, interviews and questionnaire responses. The final subsection is the Review Panel's key findings and recommendations on agreed data submission formats, specifications, and timeframes.

4.2.4.1. Review of NPFC's consideration of data submission formats, specifications, and timeframes

124. Discussions on standardizing formats for data submission were carried forward from the inter-governmental Consultations which were convened between 2006 and 2011. Standardized data collection and validation efforts and the absence of a consistent data format amongst NPFC members were common items considered across many SWG agenda prior to 2015 (for example, raised by Korea at SWG7 in 2009, the United States at SWG11 in 2013 and again by Korea SWG12 in 2014). These matters essentially remained unresolved through the Preparatory Conference (2011-2015), where for example, at the Sixth Preparatory Conference, Korea suggested the establishment of a working group to examine data fields and data formats.¹⁵⁶ The Seventh Session of the Preparatory Conference received a report from SWG13 which, *inter alia*, recommended that "a group [be established] that includes members from the SC, TCC and others to review the development of standardized reporting templates (as drafted by Korea)".¹⁵⁷

¹⁵² 5th Preparatory Conference Summary Report, Section 9.

¹⁵³ 6th Preparatory Conference Summary Report, Section 6.

¹⁵⁴ 7th Preparatory Conference Summary Report, Section 8.

¹⁵⁵ 80Options, Hobart, Australia. <https://www.eightyoptions.com.au/>.

¹⁵⁶ 6th Preparatory Conference Summary report, Section 7(1).

¹⁵⁷ 7th Preparatory Conference Summary Report, Section 7(e).

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125. At SC01 in 2015 Korea formally tabled a proposal for the development of standardized data collection forms.¹⁵⁸ However, further consideration was paused pending clarification from the Commission regarding “a. the objective for the data collection; and b. whether it was to be reported by observers or fishers, or both”.¹⁵⁹ The second meeting of the Commission in August 2016 requested that the SC and TCC hold further discussions on developing data standards building on the reporting template developed by Korea presented at the SC01.¹⁶⁰ While little progress was reported at SC02¹⁶¹, the second SSC for North Pacific armorhead (SSC NPA02), endorsed by SC02 in 2016, included advice to undertake intersessional work to develop templates for data collection and reporting by observers and fishers.¹⁶²
 126. Also in 2016, partly based on issues associated with data confidentiality, TCC02 recommended to the Commission that compliance- and science-related data and information be separated in the Annual Report.¹⁶³
 127. At SC03 in 2017, Korea provided a status report on the Corresponding Group’s work, since its establishment in 2016,¹⁶⁴ to develop standardized templates for data collection and reporting for Pacific saury (complete), bottom fish (in progress), squids (in progress), Chub mackerel (early stages) and crab fisheries (not yet started, at that time). The work was reported to be progressing in line with the SC’s Five-Year Work Plan. In addition, SC03 agreed to create a data reporting template for all gear types for Chub mackerel intersessionally in consultation with TWG CMSA members.¹⁶⁵
 128. The Secretariat updated SC04 in 2018 on progress in developing standardized templates for data collection and reporting for bottom fish (complete), Pacific saury (complete), Chub and Blue (Spotted) mackerels (not yet started; to be developed when the stock assessment model and corresponding data requirements are decided), Japanese sardine (not yet started), and squids (not yet started).¹⁶⁶
 129. TCC03 recommended that the Commission task the SWG (Ops) to explore the utility of a Standard Violation Case Package to support standardized data collection and reporting protocols from high seas boardings and inspections.¹⁶⁷
- 4.2.4.2. Review Panel’s findings relating to agreed data submission formats, specifications, and timeframes*
130. NPFC discussions on data submission formats, specifications and timelines extend back to at least 2009 – more than a decade. It is encouraging that NPFC participants recognized the importance of standardized data reporting arrangements very early in negotiations to establish the organization,

¹⁵⁸ SC01 Final Report, paras 33-35.

¹⁵⁹ SC01 Final Report, paras 33-35.

¹⁶⁰ COM02, para 15.

¹⁶¹ SC02 Final Report, paras 41-43.

¹⁶² SC02 Final Report, para 22.

¹⁶³ TCC02 Final Report, para 43.

¹⁶⁴ SC02 Final Report, paras 51-52.

¹⁶⁵ SC03 Final Report, para 19-21.

¹⁶⁶ SC04 Final Report, para 36.

¹⁶⁷ TCC03 Final Report, paras 18 and 48.

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but it is of concern that apparently, seven years after entry into force of the Convention, much still remains to be done in this regard.

131. The Review Panel appreciates that the harmonization and synchronization of data reporting standards and formats is a major exercise for a multilateral regional fisheries organization supporting fishing in areas under national jurisdiction and on the high seas. Since the establishment of the Commission, good progress has been made in relation to the sharing of standardized data to support the work of the SC's SCCs and TWGs and positive developments continue in the TCC. Although more remains to be done, and efforts are on-going, NPFC is to be commended for the progress achieved to date.
132. Although the Review Panel did not undertake an audit of the data formats and reporting processes for Pacific saury and bottom fisheries it is encouraging that, in 2018, the SC reported that these were complete. While progress continues to be made, particularly in relation to the mackerels, standardized data reporting formats and processes for other priority species remain outstanding. In addition, NPFC has not yet specified data reporting arrangements for species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities.
133. The Review Panel is of the view that the harmonization of data collection formats and associated gains in efficiency in data processing at the Secretariat, including through automated data quality assurance routines, could result in revisions to data submission deadlines. This would result in more complete quality data being available in a timely manner to support analysis and decision-making. The Commission is encouraged to take advantage of such developments. Expanding and harmonizing data collection will i) improve data administration and processing, including through opportunities to support the introduction of e-reporting, and ii) improve the timeliness and quality of data available to support analysis and decision-making for all species, including bycatch, discards and associate and dependent species.

4.2.4.3. Review Panel's recommendations

Recommendation 4.2.1. That the Commission increase efforts to characterise NPFC fisheries by expanding and harmonizing data collection formats for all species encounters, including bycatch, discards and species belonging to the same ecosystem or dependent upon or associated with the target stocks.

Recommendation 4.2.2. That the Commission task the Secretariat to contract a data management expert to undertake an intersessional review to assess data reporting formats for SC and TCC purposes and advise on opportunities for further standardization, undertake a comprehensive inventory of NPFC data, evaluate uncertainties associated with that data, identify data gaps and propose a schedule of data-related priority tasks and associated responsibilities to be annually reported to the Commission.¹⁶⁸

4.2.5. Collection and sharing of data

134. This section first describes the approach NPFC has taken to the collection and sharing of data. It is relevant for the collection of data for both conservation and management purposes and for

¹⁶⁸ This draws on a similar recommendation from the TCC03 Final Report, paras 17, 18 and 48.

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compliance purposes. It then includes the Review Panel’s assessment followed by its key findings and recommendations.

4.2.5.1. NPFC’s consideration of collection and sharing of data

135. Data availability discussions have continued to occupy significant time in the SC and its subsidiary bodies since the entry into force of the Convention in 2015. The following sections describe these discussions in relation to bottom fisheries and priority species, before turning to collection and sharing of data in TCC.

4.2.5.2. Bottom fisheries and VMEs

136. Data discussions in relation to bottom fisheries and VMEs at SC02 included consideration of VME indicators, scientifically valid encounter thresholds, VME field guides and VME data collection standards.¹⁶⁹ SC03 agreed to a joint VME- and bottom fish-related data workshop in November 2018 to, *inter alia*, develop a data “wish list”, review minimum data requirements and data availability and to consider data collection templates and data sharing protocols.¹⁷⁰ The Workshop recommended, *inter alia*, i) a review of a draft list of potentially available data to better identify current and historical bottom fishing grounds in the Convention Area and fishing footprint and effort in relation to assessing SAI; ii) to identify appropriate temporal and spatial resolution of data to be shared in order to map combined fishing footprint and effort to better identify fishing grounds and to define the fishing footprint in relation to assessing SAI; iii) to continue work on whether current indicator taxa were sufficient for determining VMEs; iv) to review the summary table of the status of the NPFC’s identification and protection of VMEs and data requirements; v) to consolidate all available VME bycatch data for combined mapping assessment; vi) to review updates and continue to revise the data availability and progress in VME protection in the NPFC against data requirements from the FAO Deep-Sea Fisheries Guidelines; and vii) to continue to develop templates to summarize existing data potentially available on bottom fishing footprint and effort, taxa, multibeam and VME predictive modelling.¹⁷¹
137. Further work on data collection on bottom fishing took place in the SSC VME,¹⁷² and the SSC BF.¹⁷³ In relation to VME-related data, SC04 endorsed the recommendations from the SSC VMEs, including a plan and timelines to determine the type and resolution of data to be shared for SAI assessment and a map of combined fishing footprint and effort, and a list of specifications regarding the design and content of the common VME taxa identification guide in the western North Pacific Ocean.¹⁷⁴ The SC noted that the SSC VME agreed to continue discussions about data sharing intersessionally, with the aim of reaching a consensus on the type and resolution of data to be shared by November 2019.¹⁷⁵
138. In relation to data and bottom fishing, SC04 in 2019 reviewed the recommendations of the SSC BF and endorsed “Interim Guidance for Management of Scientific Data”, an updated draft

¹⁶⁹ SC02 Final Report, para 18 and 20.

¹⁷⁰ SC03 Final Report, para 13 and Annex D.

¹⁷¹ NPFC-2018-WS DATA01 Final Report, para 53.

¹⁷² See NPFC-2019-SSC VME04-WP05 (Rev. 1).

¹⁷³ See NPFC-2019-SSC BF02-WP02 (Rev. 1).

¹⁷⁴ SC04 Final Report, para 6.

¹⁷⁵ SC04 Final Report, para 7.

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template for collecting scientific observer data from NPFC bottom fisheries,¹⁷⁶ the establishment of a SWG for the development of the combined bycatch taxa list for the Convention Area, and the development of the fish identification guide for scientific observers for the north-western Pacific Ocean.¹⁷⁷ SC04 agreed to combine the SSC BF and the SSC VME into one new SSC addressing VME and BF.¹⁷⁸ SC04 also agreed that Members would share data for the assessment of SAI of bottom fisheries on VME and create a map of combined fishing footprint and effort after the SSC BF-ME had agreed on the type and resolution of data.¹⁷⁹

4.2.5.3. Other priority fishery resources

139. Building on the discussions in the SWG during the Inter-governmental Consultations¹⁸⁰, data collection schemes and ways to improve reporting and data collection were discussed in the SSC PS and the first SC in 2015.¹⁸¹ Discussions included separating catch, fishing days and number of vessels by area into those that apply to national waters and those that apply in the Convention Area and a proposal to convene a workshop to, among other matters, consider research needs and data requirements to develop the next assessment.¹⁸² SC01 also noted that although there has been work on stock assessments for alfonso by Japan in 2009, there was insufficient data to complete a stock assessment. SC pointed out the necessity to continue collecting data from fisheries using different fishing gear for future stock assessments of other bottom fish species.¹⁸³
140. Data-related advice from the SSC PS endorsed by SC02 included to collect more data on the impact of IUU fishing, bycatch, and catch discarding on the Pacific saury stock and to modify the proposed data collection templates to meet the requirements for stock assessment and management.¹⁸⁴ At the third session of the Commission, Russia requested that the SSC PS develop a template for collecting data on Pacific saury bycatch and discards for the possible inclusion of these data in the stock assessment.¹⁸⁵
141. SC02 recommended the establishment of a Technical Working Group on Chub Mackerel (TWG CM) for the purpose of stock assessment with Terms of Reference including consideration of data quantity, data quality and sources of uncertainty.¹⁸⁶ SC02 also considered the status of other species, including squid, and agreed to continue to collect data and monitor the situation relating to such species.¹⁸⁷ The SC02 report was silent on the scope, process and type of data to be collected.
142. The SC04 discussed the need to report data for measuring effort and analyzing trends in effort noting various factors that impact on the capacity to report such data which include, for some species, the multi-gear nature of some fisheries which operate both within EEZs and in the Convention Area.¹⁸⁸ SC04 also agreed to share more data of Pacific saury (e.g. size-at-maturity

¹⁷⁶ NPFC-2019-SSC BF02-WP02 (Rev. 1).

¹⁷⁷ SC04 Final Report, para 13.

¹⁷⁸ SC04 Final Report, para 18.

¹⁷⁹ SC04 Final Report, para 69 (p).

¹⁸⁰ See SWG3, 2007 and SWG11, 2013.

¹⁸¹ SC01 Final Report, para. 13 and 17.

¹⁸² SC01 Final Report, para 19 and COMM2, para 17-19 and 27.

¹⁸³ SC01 Final Report, para 24 and COMM2, para 24.

¹⁸⁴ SC02 Final Report, para 27.

¹⁸⁵ COM03, Final Report, para 13.

¹⁸⁶ SC02 Final Report, para 35 and 36.

¹⁸⁷ SC02 Final Report, para 40.

¹⁸⁸ SC04 Final Report, paras 34-35 and 67.

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measurements, catch-at-size data and catch-at-age data, etc.) for improving stock assessments, and after the SSC PS agreed upon the type and resolution of data, display Pacific saury catch and effort data on a publicly accessible map on the NPFC website, and share data for Chub mackerel to support stock assessments.¹⁸⁹

143. SC05 noted that VMS data may be useful for scientific analyses and agreed with the proposed definition of “scientific purposes” which may include estimating distribution of fishing effort for use in the Commission’s research activities; planning for and implementing tagging programs; modelling fishing effort for use in fisheries management activities, including MSE; estimating abundance indices or undertaking stock assessments; validating logbook data; and, any other scientific purposes agreed to by the Commission.¹⁹⁰
144. SC06 discussed future data-related tasks for the SWG Neon flying squid, SWG Japanese sardine and Japanese flying squid and to support the development of a data template, share data, compile CPUE data and agree on CPUE indices.¹⁹¹ In relation to the SWG Blue mackerel, it was reported to SC06 that, among other tasks, the SWG had reviewed Members’ available Blue mackerel data, developed a species summary document and discussed the need to correctly identify Chub mackerel and Blue mackerel given that combined data for both species are submitted to NPFC. SC06 adopted FAO convention to use the common name of “Blue mackerel” rather than “Spotted mackerel” as the common name for this species. The SC discussed future tasks for the SWG BM which included to update the Blue mackerel species summary document, share information and papers on species identification of Blue mackerel and Chub mackerel, and continue data collation for Blue mackerel.¹⁹²
145. SC06’s review of the Research Plan (2021-2025) in relation to data agreed to the following areas of work: review of data standards related to stock assessments and other relevant data, including VME data collection and VMS, identify data sources to meet data needs for priority areas of work, develop programs for data collection, and develop a data security policy including data handling and sharing protocol, information confidentiality classification and an access control security guideline. The SC’s plans in relation to this work forecast for each year for the period 2022-2025 were restricted to: the review data standards in relation to stock assessment for priority species, to discuss the need for additional sources of data for scientific analyses and develop a data management policy.¹⁹³

4.2.5.4. TCC data sharing considerations

146. At TCC01, the Secretariat proposed that the IMO number be included among the data to be provided in relation to vessel authorizations.¹⁹⁴ The potential development of data management arrangements was referenced in the TCC Framework drafted by Canada¹⁹⁵ and appended as

¹⁸⁹ SC04 Final Report, para 20 and 69 (q) to (s).

¹⁹⁰ SC05 Final Report, para 36.

¹⁹¹ SC06 Final Report, para 18-23.

¹⁹² SC06 Final Report, para 24-26.

¹⁹³ SC06 Final Report, Annex Q.

¹⁹⁴ TCC01 Final Report, para 13.

¹⁹⁵ NPFC-2016-TCC01-WP03.

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Annex E to the TCC01 report.¹⁹⁶ No other compliance-related data matters were considered in detail during TCC01.

147. TCC02 in 2017 considered developments in relation to the Commission's VMS.¹⁹⁷ TCC02 noted most NPFC members were collecting VMS data and that it could be transmitted to the Commission as part of a regional VMS. Some Members emphasized that, in principle, flag States are responsible for managing their vessels and their VMS data.¹⁹⁸
148. TCC02 was updated on plans to improve the NPFC's vessel registry system including improved functionality providing for data validation procedures, a unique vessel identifier and for updates to be actioned at any time as opposed to annually.¹⁹⁹ TCC recommended that Members test a pilot version of the new system, clarify issues such as the minimum information requirements for registering a vessel, and revise CMM 2016-01 as necessary for TCC03.²⁰⁰ A proposal on the NPFC transshipment data format was endorsed.²⁰¹
149. At TCC03, during discussion on IUU fishing, the Commission considered the use of AIS data as a potential additional tool to facilitate vessel identification and activity.²⁰² This discussion was left open.
150. TCC04 discussed the need for as much information as possible on future IUU vessel lists to facilitate the sharing of information with other RFMOs and to make such information searchable as part of Commission's databases (see "e-reporting opportunities" Section 4.2.9 below). The TCC requested that the Commission discuss the development of a standard to address issues such as duplication of authorized vessel names by IUU vessels, database searchability and information sharing.²⁰³
151. TCC04 continued to draft the text for a CMM on VMS but was unable to reach a consensus on VMS data access and use²⁰⁴, data-sharing and data-security protocols²⁰⁵, as well as minimum standards for mobile transmitting units (MTUs).²⁰⁶ TCC04 also considered a draft CMM for a Compliance Monitoring Scheme (CMS), which would rely on quality-assured data and information.²⁰⁷ It was referred to the Commission for further consideration, noting the desire of some Members to conduct a feasibility study as a basis for further discussion.²⁰⁸
152. In relation to transshipment data, an analysis relating to NPFC Catch Statistics and NPFC Member/CNCP Flagged Vessels Register in 2018 and 2019 was presented by Japan²⁰⁹ and noted

¹⁹⁶ COM02 Final Report, para 25.

¹⁹⁷ NPFC-2017-TCC02- WP01.

¹⁹⁸ TCC02 Final Report, para 9-11.

¹⁹⁹ NPFC-2017-TCC02-IP03.

²⁰⁰ Final Report, para 19 and TCC03 Final Report, para 21.

²⁰¹ TCC02 Final Report, para 27, 29 and Annex F.

²⁰² TCC03 Final Report, para 24-29.

²⁰³ TCC04 Final Report, para 61.

²⁰⁴ NPFC2019-TCC04-WP05 (Rev. 3).

²⁰⁵ Detailed in NPFC2019-TCC04-WP04.

²⁰⁶ TTC04 Final Report, para 71.

²⁰⁷ NPFC-2019-TCC04-WP03 (Rev 2).

²⁰⁸ TCC04 Final Report, para 70 and Annex G.

²⁰⁹ NPFC-2021-TCC05-IP08.

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by TCC05.²¹⁰ Panama, in presentations relating to its CNCP status, committed to sharing all its transshipment data to assist with addressing gaps in the management of transshipment in the NPFC Convention Area and, once the NPFC establishes a regional VMS, offered to share its VMS data with the NPFC.²¹¹

4.2.5.5. Review Panel's Findings relating to the collection and sharing of data

153. The Review Panel has identified three principal issues relating to data collection and data sharing in NPFC.
154. The first, regarding priority fishery resources, relates to the utility of information on fishing effort by gear type. A record of the number of authorized fishing vessels provides limited information on the actual level of fishing effort in a fishery. Improved data for analytical purposes should report on the catch by species and the number of actual fishing days, or other suitable effort metric, by gear type. Data inventories will assist in this endeavour, and should be public unless a clear justification for confidentiality is agreed.
155. The second issue is in relation to bottom fisheries and VMEs and concerns the lack of an agreed protocol for the identification of VMEs. This includes reporting and monitoring compliance with that protocol. This issue is addressed further in Section 4.3.2.
156. The third issue concerns the collection of data related to species belonging to the same ecosystem or dependent upon or associated with the target stocks taken incidentally. NPFC has not yet specified data reporting arrangements for non-target fishery resources or encounters with species taken incidentally (see also Sections 4.2.5 and 4.5.3).

4.2.5.6. Review Panel's recommendations on the collection and sharing of data

Recommendation 4.2.3. That the Secretariat establish and maintain an inventory of NPFC non-public domain data on the section of the Commission's website restricted to Member-access, including justification for confidentiality, and a meta data inventory in the public domain on the Commission's website.

Recommendation 4.2.4. That the Commission dedicate effort and resources to the collection of data relating to bycatch and species taken incidentally in all NPFC fisheries.

4.2.6. Data gaps

157. Data gaps, data deficiencies and information sharing were common issues raised during discussions among NPFC Members in the SWG during the Inter-governmental Consultations.²¹²
158. At the first meeting of the SC (SC01), discussion on data deficiencies related to a VME encounter protocol based on UN Resolutions in 2006, and subsequent Resolutions, were deferred for inter-sessional consideration.²¹³ The situation in relation to insufficient data to support an assessment of alfonso was also discussed at SC01.²¹⁴ The SC01 Chair undertook to consult broadly across

²¹⁰ TCC05 Final Report, para 50.

²¹¹ COM05, Final Report, para 13.

²¹² See <https://www.npfc.int/meetings/meeting-type/24>. Note that the reports of the first three sessions of the SWG are not currently available on the Commission's website.

²¹³ SC01 Final Report, para. 38 and COM02 Final Report, para 36.

²¹⁴ SC01 Final Report, para 24.

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SSCs and TWG's on data deficiencies and potential initiatives to improve data availability to support the scientific program of the Commission. Discussion on data gaps and deficiencies have remained a feature of discussions in the SC's SSCs and TWGs, and to a lesser extent the TCC, since.

159. At COM03, it was noted significant gaps existed in the submission of transshipment data with only two Members complying. The Commission encouraged other Members to submit the required data.²¹⁵
160. In 2019, SC05 considered the development of summary profiles for all priority species to identify potential data gaps and to track progress towards establishing management targets or limits to determine stock status. The SC reviewed a proposed template for the profiles and agreed to include information on biological characteristics and behaviour and to separate the species profile from a data summary for each species.²¹⁶
161. The agenda of SC05 also included an item supporting discussion on the identification of data needs and data gaps and discussion for an observer program and other ways to fill data gaps. The three paragraphs of the Report of SC05 summarizing discussion on this item were primarily dedicated to consideration of the potential for EM to address data gaps.²¹⁷
162. SC06 in 2021 appended profiles for Pacific saury, Splendid alfonsino, North Pacific armorhead, two species of Rockfish, Sablefish, Japanese sardine, Japanese flying squid, Neon flying squid, and Blue mackerel to its session report²¹⁸. Tables summarizing the source and type of data available to NPFC for each species were included in the annexes. To supplement these summaries, SC06 tasked the SWGs for Japanese flying squid, Neon flying squid, Japanese sardine and Blue mackerel, which were established by SC05 in 2020, to identify data needs, data gaps, and strategies to fill those gaps.²¹⁹

4.2.6.1. Review Panel's findings relating to data gaps

163. Despite recurring discussion across the Commission over many years, the Review Panel found it challenging to accurately determine the status of NPFC data and identify where critical data-related issues persist. Reference to data gaps and deficiencies has been a recurring feature of discussions in the SC and its subsidiary bodies as recorded in meeting documentation and summary reports.²²⁰ Unless intimately involved in the work of these groups it is currently difficult to i) access an inventory of data either held by the Commission or available to it, or ii) obtain details relating to data gaps and deficiencies.
164. In relation to obvious data gaps, the Panel was unable to obtain data or information relating to estimates of IUU fishing in the NPFC Convention Area and the potential impact of IUU fishing on NPFC fishery resources and associated ecosystems. Given the expected impact of IUU fishing on stocks and the reliability of data used in stock assessments, the Commission is encouraged to undertake a robust assessment of IUU fishing in the NPFC Convention Area.

²¹⁵ COM03 Final Report, para 16.

²¹⁶ SC05 Final Report, para 31 and 32.

²¹⁷ SC05 Final Report, para 26-28.

²¹⁸ Summaries of the profiles prepared at SC6 are included in this Review Report at Appendix XX.

²¹⁹ SC06 Final Report, para 34.

²²⁰ See Annexes to the SC06 Final Report.

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4.2.6.2. Review Panel's recommendations on data gaps

Recommendation 4.2.5. That the SC and the TCC each undertake a comprehensive assessment, updated annually, summarizing the NPFC data inventories and the status of data gaps and deficiencies in NPFC data and report the outcomes to the annual session of the Commission.²²¹

Recommendation 4.2.6. That the Commission seek opportunities for collaboration with other RFMOs with shared interests in the North Pacific Ocean and appropriate technical agencies, such as Global Fishing Watch (GFW) and the IMCS Network, to assess the level and impacts of IUU fishing on NPFC fishery resources.

4.2.7. Data management policy and procedures

165. At SC01 Japan raised the issue of a NPFC data management policy.²²² SC02 in 2016 considered the development of a NPFC data management system including a project strategy and architecture, business context, the system context, design, and development roadmap.²²³ The Secretariat was requested to progress this,²²⁴ and subsequently prepared draft “Information Security Guidelines” which included four categories of information in relation to risk of its disclosure, types of information, proposed regulations for each data type, protection of data ownership and other issues related to data and publication handling by the NPFC.²²⁵ In response, the SC recommended the establishment of a Corresponding Group to work intersessionally with the TCC to further develop the draft “Information Security Guidelines”.²²⁶ TCC02 was provided with an update on the work of the SC and the intersessional Corresponding Group endorsing the need for progress on this issue as a priority.²²⁷
166. At SC03, based on an update provided by the Secretariat,²²⁸ the SC03 drafted regulations for the management of scientific meeting documents, meeting reports and intersessional communications on the NPFC collaboration website,²²⁹ and agreed to work intersessionally before the Commission meeting in July 2018 to review potential issues related to the sharing of data and, if necessary, revise the “Interim Guidance for Management of Scientific Data used in Stock Assessments” adopted in 2017.²³⁰
167. TCC03 received two papers specific to data management tabled by the Secretariat.²³¹ Among other decisions, TCC03 proposed that the Commission endorse the development of data-sharing and

²²¹ The WCPFC’s periodically revised *Scientific data to be provided to the Commission* and the annual report submitted to the WCPFC’s Scientific Committee by WCPFC’s Science Services Provider detailing data gaps provide useful examples for consideration in revising NPFCs data policies and strategies. See: <https://www.wcpfc.int/scientificdatasubmission>

²²² SC01 Final Report, para 45 and COM02 Final Report, para 45.

²²³ NPFC-2017-SC02-WP04 (Rev1).

²²⁴ SC02 Final Report, paras 53-56.

²²⁵ NPFC-2017-SC02-WP03 and NPFC-2017-SC02-IP01.

²²⁶ SC02 Final Report, paras 51-52.

²²⁷ NPFC-2017-TCC01-WP05; TCC Summary Report, para 13 and 14.

²²⁸ NPFC-2018-SC03-IP02.

²²⁹ SC03 Final Report, Annex G.

²³⁰ COM03 Final Report, para 41 and 42, Annex Q and COM04 Final Report, para 36, Annex O.

²³¹ NPFC-2018-TCC03-IP03: “Data Management and the Way Forward” and NPFC-2018-TCC03-IP04 “Vessel Registry - Data Information Requirements”.

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data-security protocols by TCC, SC and Finance and Administration Committee (FAC) to ensure the secure handling and confidentiality of Commission data.²³²

168. SC04 reviewed progress with Commission policy relating to data collection, management and security²³³ and endorsed some revisions to the “Interim Regulations for Management of Scientific Data and Information”,²³⁴ which included regulations for management of scientific meeting documents, meeting reports and intersessional communications on the NPFC website.²³⁵
169. At TCC04 Canada presented a draft for “NPFC Data-Sharing and Data-Security Protocols for VMS Messages” as proposed by the SWG VMS²³⁶ and an update on “NPFC Data Collection, Compilation and Exchange Interim Guidelines” for further consideration at TCC05 and the following session of the Commission.²³⁷
170. COM05 reviewed the status of the development of “NPFC Information Security Guidelines”, noting that such guidelines should cover both scientific and compliance aspects. The Commission endorsed the “Interim Regulations for Management of Scientific Data and Information” developed and adopted by the SC,²³⁸ and requested the TCC to continue to develop guidelines from a compliance perspective for consideration at the next Commission meeting.²³⁹
171. SC05 reviewed the “Interim Regulations for Management of Scientific Data and Information” and recommended that the Commission endorse them as formal regulations of the SC and its subsidiary bodies. The “Regulations” include sections relating to the management of scientific data, the management of meeting documents, and intersessional communications using the NPFC collaborative website supporting discussion in subsidiary bodies and informal working groups on NPFC projects. In adopting this “Regulation”, the SC also requested that the TCC consider the inclusion of the Regulations as an annex to the “NPFC Data Sharing and Data Security Protocols” that the TCC was developing as an overarching data policy for the Commission.²⁴⁰
172. The Secretariat reported to SC05 on the ongoing work to draft the “NPFC Data Sharing and Data Security Protocol²⁴¹” and the “NPFC Data-Sharing and Data-Security Protocol for VMS Data”.²⁴² The SC noted that VMS data may be useful for scientific analyses and agreed with a proposed definition of “scientific purposes”.²⁴³
173. At TCC05, the Secretariat provided a summary of MCS matters for coordination between the SC and the TCC which included the proposed incorporation of the “Regulations for Management of Scientific Data and Information” in the “NPFC Data Sharing and Data Security Protocols”.²⁴⁴ TCC05 also received a report from the co-lead of the SWG for Planning and Development (SWG

²³² TTC03 Final Report, paras 17, 18 and 48.

²³³ NPFC-2019-SC04-IP01 (Rev. 2).

²³⁴ NPFC-2019-SC04-WP01 (Rev. 1).

²³⁵ SC04 Final Report, Annex J.

²³⁶ NPFC-2019-TCC04-WP04.

²³⁷ TTC04 Final Report, para 72.

²³⁸ NPFC-2019-COM05-WP08.

²³⁹ COM05 Final Report, para 40.

²⁴⁰ SC05 Final Report, para 34 and 64.

²⁴¹ NPFC-2020-SC05-WP06.

²⁴² NPFC2020-SC05-WP07.

²⁴³ SC05 Final Report, paras 35 and 36.

²⁴⁴ TCC05 Final Report, para 6.

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PD) concerning a proposal for the development of an “NPFC Data Sharing and Data Security Protocol for the VMS”.²⁴⁵ The “Protocol” was subsequently adopted at COM06.²⁴⁶

174. The Secretariat presented a summary of the status of all compliance-related information technology and data management systems completed, or under development, at the Secretariat to TCC05.²⁴⁷ Completed systems include the direct entry Vessel Registration System, Meeting Management, Calendar, e-Annual Report, Pacific Saury Weekly Report, Collaboration site, e-IUU, e-HSBI, HSBI Events, CMM Chart of Accounts and Data Warehouse Dashboard with the VMS and an Electronic Compliance Monitoring System (e-CMS) under development.²⁴⁸
175. The Secretariat also provided SC06 with a report on the progress in the development of the SC-related data management system since SC05²⁴⁹. It noted, among other developments, the status of the NPFC GIS Map with additional updates for Pacific saury catch and effort data and, at the request of the SSC BF-ME, that provisional maps of combined gear-specific footprints by different gear types and time periods were well advanced.²⁵⁰
176. Prior to the postponement of TCC06 in 2022 papers for discussion at the session were posted on the meeting webpage. Data related papers included an update on data management initiatives,²⁵¹ a transshipment paper submitted by the SWG PD which included a draft CMM that provides for data and information sharing,²⁵² and proposed amendments to the Vessel Registry submitted by the SWG (Operations).²⁵³

4.2.7.1. Review Panel's findings relating to data management policies and procedures

177. The Review Panel acknowledges the significant amount of work undertaken in relation to NPFC data management policies and procedures. Many of these initiatives started during the Preparatory Conference largely motivated by the experience of individual NPFC Members in other RFMOs.
178. The Review Panel was unable to determine the reasons for the slow development of a standardized Commission-wide data policy. It remains a recurring matter which absorbs significant time in meetings of the SC and its subsidiary bodies and in the TCC. NPFC participants have significant experience in RFMO data management generally and so it is not clear why that experience and knowledge appears not to have been applied for the benefit of NPFC in a timelier manner. There is considerable room to strengthen NPFC data management policies and procedures consistent with international best practice and experience in other RFMOs and harmonize them for all data functions across the Commission.²⁵⁴

²⁴⁵ NPFC-2021-TCC05- WP04.

²⁴⁶ COM06 Final Report, para 28 and Annex J.

²⁴⁷ NPFC-2021-TCC05-IP02.

²⁴⁸ TCC05 Final Report, para 29 and Comm6, para 31.

²⁴⁹ NPFC-2021-SC06-IP03.

²⁵⁰ SC06 Final Report, para 38.

²⁵¹ NPFC-2022-TC06-IP04.

²⁵² NPFC-2022-TC06-WP23.

²⁵³ NPFC-2022-TC06-WP22.

²⁵⁴ Secretariat staff advised that some initial work in this regard had been undertaken by the Secretariat and examples, such as the Asia-Pacific Fishery Commission, offered useful information that could be drawn upon to develop an overarching data management policy for NPFC

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4.2.7.2. Review Panel's recommendations on data management policies and procedures

Recommendation 4.2.7. That the Commission undertake an independent expert review of data-related policies and procedures currently implemented, or under development, in the SC and TCC, with the objective of critically reviewing existing policies and procedures against international best practice and experience in other RFMOs to strengthen and harmonize NPFC data management policies and procedures for all data functions across the Commission.

4.2.8. The Secretariat's support for data management

179. Since 2017, the Secretariat has contracted the services of a data management systems and website development company to provide data systems support to the Secretariat.²⁵⁵ The Commission has been regularly updated on this work through a standing agenda item relating to data management and security.²⁵⁶ In that time, based on a strategic assessment of the business needs for a range of data-associated functions that the Secretariat is responsible for in supporting the work of the Commission and its subsidiary bodies, a range of electronic and web-based systems have been developed and deployed. The Secretariat retains the services of the company on contract to provide on-going system refinement and maintenance. The strategic approach that has been employed, and the phased implementation, has proven effective with a significant improvement in the Secretariat's data administration capacity since 2017.

4.2.8.1. Review Panel's findings relating to the Secretariat's support for data management

180. The Panel commends the Commission for supporting the development of data management services at the Secretariat and the Secretariat for its effective implementation.
181. Subject to the approval of the Commission, and the allocation of adequate supporting resources, planned future work also appears to be appropriate and well-formulated. Continued support from the Commission for this work is recommended.

4.2.9. Future opportunities to improve data quality²⁵⁷

182. The Review Panel notes that there are numerous opportunities for NPFC to broaden and strengthen the use of e-reporting to improve both the timeliness and quality of data submission to the Commission. Some of these opportunities have already received early consideration in the Commission, SC or TCC. They include the items set out in the following sub-sections.

4.2.9.1. Transshipment and port State measures

183. Summary transshipment data is currently primarily collected through the Annual Reports. The Secretariat's on-line system enables Members to submit transshipment details at any time throughout the year. Any data submitted in such a manner is collated into the electronic Annual Report which is available for final submission by Members each January. The on-line facility is reportedly currently under-utilized by Members.

²⁵⁵ 80Options based in Hobart, Tasmania, Australia.

²⁵⁶ For example, see COM03 Final Report, para 38; COM04 Final Report, para 34; COM05 Final Report, para 39, and COM06 Final Report, para 53.

²⁵⁷ Informed by discussions with Tony Miller, 80Options (NPFC data services and website administration provider), April 2022.

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184. Data collected on transhipments does not currently include all the fields outlined in CMM 2016-03 that vessels are required to provide to their flag State. A future revision of CMM 2016-03 could address this deficiency to make the provision of all transhipment data mandatory to NPFC. It is possible for that data to be directly supplied from the vessels to the Secretariat similar to models that are implemented in other RFMOs and as offered by Panama at COM05 (para. 13).
185. The existing interim Measure on transhipment will likely be subject to review and there is a possibility that the Commission will consider a CMM for port State measures soon. Both offer opportunities for standardizing data reporting formats which would facilitate more timely reporting, strengthen data validation routines and broaden analytical possibilities.

4.2.9.2. Annual Reports

186. The electronic Annual Report facility is also currently an underutilized feature with a number of Members continuing to submit their reports by emailing PDF attachments. There is potential to improve this requirement by revising the Annual Report templates to provide for more quantitative responses in standardized formats. This would facilitate full migration to e-reporting which will result in significant efficiency gains in relation to both the timeliness of the submission of Reports and the quality of information submitted through automated validation routines.

4.2.9.3. VMS

187. The VMS offers opportunities for undertaking analysis of the VMS data e.g. identifying vessels not reporting positions, potential transhipment detection and improved assessment of fishing effort. For example, if transhipment latitude and longitude data was collected, transhipment reports could be verified against VMS data.

4.2.9.4. The Exploratory Fisheries Protocol

188. The Exploratory Fishery Protocol (CMM 2021-05 and 2021-06, Annex 1) offers potential for converting to an online standardized format which would then provide opportunities for cross-referencing against vessels reporting from the restricted seamounts.

4.2.9.5. The IUU Vessel List

189. The electronic system for submitting proposed IUU listings is in early stages of implementation. As experience with the process increases there may be opportunities for improvement. In addition, RFMOs have been discussing the possibility of sharing IUU lists for many years. NPFC's IUU list is already available via an application programming interface (API) so could quite easily be read programmatically by other RFMOs. This capability has broader application, subject to the approval of the Commission, for iuu-vessels.org and GFW related initiatives.

4.2.9.6. Scientific Observer Program

190. The data collected by observers through the bottom fisheries Scientific Observer Program is well defined. A common system for recording and reporting this information could be developed for use by Members, or directly by observers.²⁵⁸ This would enable observer generated data to flow through to the NPFC data warehouse to facilitate analysis combined with other data, e.g. VMS.

²⁵⁸ In 2019, the Secretariat provided SSC PS4 with a paper providing a template for scientific data to be collected by Observers for discussion (NPFC-2019-SSC-PS4-WP2).

4.3. Capacity management

191. There is one reference specific to fishing capacity in the Convention. This is included as a general principle which provides that Members, collectively or individually, will prevent or eliminate overfishing and excess fishing capacity. Members will ensure that levels of fishing effort or harvest levels are based on the best scientific information available and do not exceed those commensurate with the sustainable use of the fisheries resources.²⁵⁹
192. To achieve this, the functions of the Commission include requirements to adopt CMMs that specify levels for total allowable catch or total allowable fishing effort ensuring that limits are based on the best scientific information available, and the advice of the SC.²⁶⁰

4.3.1. Pelagic fishery resources

193. The provisions of Article 3 relating to capacity management in the decisions of the Commission were first drawn upon at COM02 in 2016. At that session the Commission revised its Pacific saury CMM adopted in 2015,²⁶¹ to i) acknowledge the provisions of the preambular paragraphs of the Convention in relation to capacity management, and ii) to separate the capacity management provisions of 2015-02 into those applying to the Convention Area and those applying to areas under national jurisdiction.²⁶² The Measure required Members to refrain from rapid expansion of the numbers of their fishing vessels fishing for Pacific saury to the levels existing at that time.
194. COM02 also adopted a CMM for Chub mackerel that included obligations for both Members and CNCs. Rather than calling for constraints on “rapid expansion” as provided for in the Pacific saury Measure, the Chub mackerel Measure encouraged Members and CNCs to refrain from “expansion” of the number of vessels authorised to fish from the “historical existing level” rather than the “existing level” as in the Pacific saury measure. The CMM requested Members participating in Chub mackerel fisheries in areas under national jurisdiction to take compatible measures.²⁶³
195. The Pacific saury Measure was revised at COM03 in 2017 to require Members fishing in the Convention Area to refrain from expanding the number of vessels authorised to fish for Pacific saury from the “historical existing level”.²⁶⁴ Within areas under national jurisdiction, Members were to refrain from “rapid expansion” of the number of vessels authorised from the “historical existing level”.²⁶⁵ Members fishing for Pacific saury in areas under national jurisdiction adjacent to the Convention Area were requested to take compatible measures.²⁶⁶

²⁵⁹ Convention, Article 3(f).

²⁶⁰ Convention, Article 7 (a) and (b).

²⁶¹ CMM 2015-02 encourages Members to refrain from rapid expansion, in the Convention area, of the number of fishing vessels entitled to fly their flags and authorized to fish for Pacific saury from the existing level until the stock assessment by the SC and SC.

²⁶² COM02 Final Report, Annex O; CMM 2016-02 Pacific saury, paras 1 and 2. Note, the correct paragraph reference is 4, not 6, a cross referencing error in both CMM 2015-02 and CMM 2016-02

²⁶³ CMM 2016-07, paras 1 and 2.

²⁶⁴ CMM 2017-08, para 1.

²⁶⁵ CMM 2017-08, para 2.

²⁶⁶ CMM 2017-08, para 3.

4.3.2. Bottom fisheries

196. At COM02, in discussion on conservation and management arrangements for bottom fisheries, and on the advice of the SC01²⁶⁷, Members agreed to, *inter alia*, “Limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems”.²⁶⁸
197. The “2007 level” was provided for in interim measures adopted at the 2nd Intergovernmental Meeting in February 2007 which included the “Establishment of new mechanisms for protection of VMEs and sustainable management of high seas bottom fisheries in the Northwestern Pacific Ocean”.²⁶⁹ The Interim Measures set out two objectives: the sustainable management of fish stocks and the protection of VMEs. Among other provisions contained in the interim measures, participants agreed to limit fishing effort to the existing level and not to expand bottom fisheries into new areas while working on a long-term agreement to achieve the identified objectives.
198. Two proposals were tabled to TCC01 in 2016 by the NPFC Corresponding Group based on the Interim Measures. One was a draft proposal for a CMM for bottom fisheries in the Northwest Pacific Ocean and the other was a draft CMM for the protection of VMEs in the North-eastern Pacific Ocean²⁷⁰. TCC01 recommended that the Commission consider adoption of the CMMs on bottom fisheries and on VME protection²⁷¹. Subsequently, COM02 in 2016 formally adopted two CMMs. One concerned the management of bottom fisheries and the protection of VMEs in the Northwestern Pacific Ocean²⁷². The second concerned bottom fisheries and the protection of VMEs in the North-eastern Pacific Ocean.²⁷³ Both CMMs provide for the limitation of fishing effort in the Convention Area.
199. CMM 2016-05 requires Members to limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems. It also provides that bottom fisheries do not expand into the western part of the Convention Area where no such fishing is currently occurring.²⁷⁴
200. CMM 2016-06 provides that the limit will be based on the historical average applying a baseline determined by the SC in terms of “the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems dependent on new SC advice”.²⁷⁵
201. The “Exploratory Fishery Protocol in the North Pacific Ocean” attached to both Measures, provides *inter alia* that, precautionary CMMs, including catch and effort controls, are essential during the exploratory phase of deep-sea fisheries and, further, that implementation of the

²⁶⁷ COM02 Final Report, para 13.

²⁶⁸ COM02 Final Report, Annex P - CMM 2016-05, para 4A.

²⁶⁹ 2nd Inter-governmental Meeting Summary Report, Attachment 6.

²⁷⁰ NPFC-2016-TCC1-WP08 Rev.2a and 2b respectively.

²⁷¹ TCC01 Final Report, para 27.

²⁷² CMM 2016-05.

²⁷³ CMM 2016-06.

²⁷⁴ CMM 2016-05, para 4A and 4B.

²⁷⁵ COM02 Final Report, Annex Q - CMM 2016-06, para 3(i).

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Measures requires comprehensive monitoring of all fishing effort.²⁷⁶ Related annexes specifying data requirements including the obligation to report on effort.²⁷⁷ These annexes have been maintained unchanged in relation to these specific reporting requirements in subsequent revisions of the two bottom fishery Measures through to the current Measures.²⁷⁸

202. COM03 revised the two bottom fishing Measures at its session in 2017. There was no change to the provisions of para 4A of CMM 2016-05 in relation to the management of fishing capacity in the Northwest Pacific Ocean.²⁷⁹ However, paragraph 3(i) of CMM 2016-06 was revised to provide that information in relation to historic levels of fishing capacity would be “based on information provided by Members in terms of number of fishing vessels or other parameters...”.²⁸⁰ “Other parameters” were not specified. COM03 also revised the Pacific saury Measure to, among other refinements, include reference to the General Principles of Article 3 of the Convention relating to capacity management in its preamble.²⁸¹
203. At the fourth, fifth and sixth sessions of the Commission, the fishing capacity-related provisions of the two bottom fishing Measures, the Pacific saury and Chub mackerel Measures remained unchanged.²⁸²

4.3.3. Other fishery resources

204. At COM05 in 2019, Members adopted a new Measure for Sablefish.²⁸³ The preambular paragraphs acknowledge the provisions of Article 3 of the Convention (particularly Article 3 (b) and (f)) on capacity management. CMM 2019-10 restricts the current harvest of Sablefish in the eastern part of the Convention Area from expanding beyond the “existing historical level”.²⁸⁴ The Measure also constrains Members with historical, but no current, harvest of Sablefish in the eastern part of the Convention Area, from expanding their fishery subject to relevant provisions of the Convention. Any development of new fishing activity is to be determined in accordance with *inter alia*, provisions of the Convention and, if in areas of national jurisdiction adjacent to the eastern part of the Convention Area, in accordance with the Exploratory Fishing Protocol attached to the bottom fishing and the protection of VMEs CMMs.²⁸⁵ The CMM remained in place through 2021.

4.3.4. Measures and management of capacity

205. The Review Panel notes that the issue of measuring fishing capacity has received consideration in the TCC and the SC for some time. In 2018, TCC recommended the Commission develop better indicators of fishing effort.²⁸⁶ In relation to this, Japan expressed concern over the fishing effort for Pacific saury and Chub mackerel and suggested the need to understand the number of vessels authorized to fish these species, and to revise CMM 2017-07 and CMM 2017-08 to require

²⁷⁶ CMM 2016-05, Annex I and CMM 2016-06, Annex I.

²⁷⁷ CMM 2016-05, Annexes 2 and 5 and CMM 2016-06, Annexes 2 and 5.

²⁷⁸ CMM 2021-05 and CMM 2021-06.

²⁷⁹ COM03 Final Report, Annex K.

²⁸⁰ COM03 Final Report, Annex L.

²⁸¹ COM03 Final Report, Annex O.

²⁸² Except para 2 of CMM 2018-08 which was made explicit to Japan and Russia (COM04 Final Report, Annex M).

²⁸³ CMM 2019-10.

²⁸⁴ CMM 2019-10, para 2.

²⁸⁵ CMM 2019-06 and CMM 2019-05, Annex 1; CMM 2019-10, para 2-5.

²⁸⁶ TCC03 Final Report, para 8.

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Members to report this information.²⁸⁷ Subsequently, at COM04 that year, the Commission extended CMM 2017-08 for Pacific saury with revisions to incorporate effort controls, measures to prevent the discard of catch, and measures to protect juvenile fish.²⁸⁸

206. The SC has also provided advice to the Commission, based on the work undertaken by the SSC TWG PSSA, that further management measures for avoiding increasing trends in the exploitation rate of Pacific saury and to sustain biomass, are required.²⁸⁹
207. The SC04 in 2019 discussed the need to report data for measuring effort and analysing trends in effort noting various factors that impact on the capacity to report such data including, for some species, the multi-gear nature of some fisheries which operate both within EEZs and in the Convention Area.²⁹⁰
208. Also in 2019, the Secretariat provided an update on the work to address fishing effort indicators by the SWG on Vessel Registry (SWG VR) to TCC04.²⁹¹ The Committee noted that the number of active vessels may be a better indicator of effort than the number of authorized vessels, which was the measure in CMM 2017-07 for Chub mackerel and CMM 2017-08 for Pacific saury. TCC04 recommended that the Commission “task TCC, working with SC, to develop advice on effort indicators, including for CMMs 2017-07 and 2017-08, that would effectively control fishing effort”.²⁹²
209. Detailed catch and effort (number of vessels) information can be found in the annual summary footprints for each of the NPFC priority fisheries on the Members’ page of NPFC website.²⁹³ The Review Panel notes that, for the period to 2017, Members complied with the provisions of the Pacific saury and Chub mackerel Measures (CMM 2017-07 and CMM 2017-08 respectively) to not extend their fishing effort in terms of numbers of authorized vessels. However, in terms of the number of active vessels and days fished, fishing days varied from year to year. For example, one Member almost doubled the number of active fishing vessels in the Chub mackerel fishery in its EEZ between 2017 and 2018. This is not consistent with the provisions of CMM 2018-07 (paragraph 3). As noted at TCC04, the current definition of ‘effort’ based only on the number of authorized fishing vessels, or number of active vessels, are not efficient means to assess and monitor fishing mortality and the impact of fishing on stocks. This remains an issue for the TCC, SC and Commission to address. (See also Section 4.2.5).

4.3.5. *New entrants – capacity issues*

210. In 2019 the EU sought to apply for accession to the NPFC Convention.²⁹⁴ The Commission tasked the SC, the TCC, and any of their relevant subsidiary bodies to review the application provided by the EU.²⁹⁵ SC05 the following year noted that the EU’s Fisheries Operation Plan included plans to fish for Chub mackerel and other NPFC priority species. The SC noted that the current CMM

²⁸⁷ TCC03 Final Report, para 11.

²⁸⁸ COM04 Final Report, paras 27-29 and Annex M.

²⁸⁹ SC04 Final Report, para 23.

²⁹⁰ SC04 Final Report, paras 34-35 and 67.

²⁹¹ TCC04 Final Report, paras 16-17.

²⁹² TCC04 Final Report, para 18.

²⁹³ <https://www.npfc.int/statistics>

²⁹⁴ COM05 Final Report, para. 6.

²⁹⁵ COM05 Final Report, paras 6-10).

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for Chub mackerel, CMM 2019-07, as well as CMMs for most NPFC priority species, are effort-based rather than catch-based, and that the EU's accession to the NPFC could result in increased fishing effort for these species. The SC suggested that catch-based measures may be more effective for ensuring the long-term sustainability of Chub mackerel and other priority species but recognized that it had not made enough progress in its stock assessment work to provide advice on such measures.²⁹⁶

211. At COM05 Russia initially objected to EU's accession and provided a statement, which, among other matters, referred to concerns relating to overfishing and the sustainability of NPFC fishery resources and the EU's proposal to introduce additional fishing capacity to the Chub mackerel fishery.²⁹⁷ Subsequently, the First Special Meeting of the SC in 2021 noted that total effort in the Pacific saury fishery had steadily increased from 1995 to 2019 and that the number of active vessels in 2019 was the highest on record.²⁹⁸ At the following Commission session in 2021, additional Members expressed concern at the size and capacity of the vessel proposed by the EU for fishing Chub mackerel.²⁹⁹ Nevertheless Members invited the EU to accede to the NPFC Convention by consensus.³⁰⁰

4.3.6. Review Panel's findings relating to capacity management

212. In relation to pelagic fisheries, the "existing level" nor "historical existing level" in respect of either the CMM for Pacific saury or Chub mackerel, have not been elaborated. For Chub mackerel this provision was carried forward in each annual revision to the current version of the Measure, CMM 2019-07. Subsequently, by simply changing the species referred to, the same two paragraphs were replicated in CMM 2019-11 for Japanese sardine and Japanese flying squid. CMM 2019-11 was revised at the annual session of the Commission in 2020 to include Neon flying squid so that the same general provision referencing capacity applies to five species across three NPFC Measures.³⁰¹
213. The Review Panel is concerned that the Commission's understanding of the "historic" or "existing" levels of fishing capacity for all fisheries harvesting NPFC fishery resources has not been clarified. It supports the advice provided by TCC04 in 2018 that the Commission "task TCC, working with SC, to develop advice on effort indicators."³⁰²
214. The Panel was also unable to verify how measures for NPFC fishery resources in areas under national jurisdiction are assessed for compatibility and efficacy.
215. Regarding bottom fisheries, there is no record to determine if the level provided for in interim measures adopted at the 2nd Intergovernmental Meeting in February 2007 was ever described and formally agreed. The Review Panel was unable to determine if the SC had reached consensus on the fishing effort baseline for the North-eastern Pacific Ocean or if the Commission had ever agreed to the limitation of effort for bottom fisheries in the Northwestern Pacific Ocean based on

²⁹⁶ SC05 Final Report, paras 22, 23 and 67(f).

²⁹⁷ COM05, Final Report, para 12 and Annex E.

²⁹⁸ SC-Special Final Report, para 11 and Annex D.

²⁹⁹ COM06 Final Report, para 9.

³⁰⁰ COM06 Final Report, paras 6-8. The latest EU Fisheries Operation Plan is contained in NPFC-2021-TCC05-OP1.

³⁰¹ COM06 Final Report, paras 47-48, Annex R - CMM 2020-11.

³⁰² TCC04 Final Report, para 18.

either i) the “level agreed in 2007” or ii) “other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems”. While “existing level” was apparently not defined, footprint data and information, in terms of the number of active vessels and the number of fishing operations (tows), have been provided to the SC, to facilitate the SC’s assessment if the “level” had been exceeded.

216. The level of fishing mortality associated with IUU fishing on all NPFC fishery resources is unknown. IUU fishing has the potential to significantly impact capacity management in NPFC fisheries adversely impacting on the sustainability of target stocks and compromising efforts to implement an ecosystem approach to management of NPFC fishery resources. This issue has been raised in Section 4.2 and is also an issue that will be covered further in Section 5.2.

4.3.7. The Review Panel’s recommendations on capacity management

Recommendation 4.3.1. That the Commission prioritize the development of Terms of Reference to contract appropriate technical expertise to assist with developing advice on effort indicators for fishing capacity for all fisheries harvesting NPFC fishery resources.

4.4. Fishing allocations and opportunities

217. The functions of the Commission set out in Article 7, include to “determine the nature and extent of participation in existing fisheries, including through the allocation of fishing opportunities”;³⁰³ establish by consensus the terms and conditions for any new fisheries in the Convention Area and the nature and extent of participation in such fisheries”;³⁰⁴ and agree on the “means by which the fishing interests of new Contracting Parties may be accommodated in a manner consistent with the need to ensure the long-term sustainability of the fisheries resources”.³⁰⁵ This is consistent with Article 3(h) of the Convention that any expansion of fishing effort or the development of new or exploratory fisheries is not to proceed without prior assessment of the impacts of those fishing activities on the long-term sustainability of fisheries resources.
218. The Commission has considered the allocation of fishing opportunities among existing Members or new interests through the CMMs for certain priority species, such as Pacific saury and Sablefish, and through its response to potential new entrants. However, there are currently no allocation criteria specified in either the Convention or in CMMs. Decisions are therefore taken on *an ad hoc* basis. These issues have become more pressing in recent years as it has become evident that recent fishing mortality is unsustainable for most priority fishery resources and new entrants (the European Union) have recently acceded to the NPFC Convention.

4.4.1. Pacific saury

219. At COM04 in 2018, the Commission adopted a provisional Measure for Pacific saury that provided that, until the Commission decided on the allocation of the TAC, each Member of the Commission shall ensure that the total catch of Pacific saury by its flag fishing vessels in 2020 will not exceed its reported catch in 2018 with the expectation that the total catch in the Convention Area will not

³⁰³ Convention, Article 7(f).

³⁰⁴ Convention, Article 7(g).

³⁰⁵ Convention, Article 7(h).

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exceed 330,000 metric tons.³⁰⁶ Members fishing for Pacific saury in areas under their jurisdiction adjacent to the Convention Area were able to divert part of their catch limit for areas under their jurisdiction to the catch by their flag vessels of Pacific saury in the Convention Area.³⁰⁷ These provisions were to be subject to review and revision, as appropriate, based on the advice and recommendations from the SC.³⁰⁸

220. While it was envisaged that Members would consider the allocation of the TAC in the Convention Area in 2020,³⁰⁹ this did not occur. In view of the stock situation for Pacific saury, the Commission agreed in 2021 to a reduction in catch of Pacific saury by 40% from a Member's 2018 reported catch.³¹⁰ Members also confirmed their commitment to advance an MSE process for Pacific saury, given the urgent need for effective management of the stock.³¹¹ A joint SC-TCC-COM Small Working Group (SWG-MSE-PS) was established in 2021 to work towards establishing HCR for Pacific saury as an interim measure as soon as possible and to consider the establishment of a MP through a MSE process.³¹²
221. Although the decision of COM06 to reduce the catch of Pacific saury by 40% was encouraging, the challenges ahead for NPFC in relation to allocation and the sharing of fishing opportunities are highlighted by i) the relatively early stages of discussions on establishing a MP including an MSE for Pacific saury, ii) the fact that allocation has not yet been taken up in that discussion, and iii) that other priority species require similar attention.
222. The SWG-MSE-PS held its first meeting in 2022, building on the work started at a "NPFC BCP/HCR/MSE Workshop" in 2019. The SWG-MSE-PS was advised that the current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is greater than a TAC based on the F_{MSY} ($B_{2021} * F_{MSY} = 192,804$ tons) and that the current biomass is lower than B_{MSY} . In the short term, a HCR that reduces the fishing mortality as biomass falls may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).³¹³ The SWG-MSE-PS agreed to conduct intersessional technical work on developing a concrete proposal for reference points and management objectives and developing and evaluating HCRs as a short-term task.³¹⁴ Although the SWG-MSE-PS is proceeding, it is still at the early stages of its work. Longer-term, the development of a MP process may facilitate agreement on allocation consistent with the longer-term sustainability of the fisheries resources.

4.4.2. Other priority fisheries

223. The Commission has approached the allocation of fishing opportunities in some other priority species through a stand-still mechanism. For example, in the case of Sablefish, Members adopted a CMM in 2019 which restricts the current harvest of Sablefish in the eastern part of the

³⁰⁶ CMM 2018-07, para 7.

³⁰⁷ CMM 2018-07, para 9.

³⁰⁸ CMM 2018-07, para 10.

³⁰⁹ CMM 2019-08, para 6.

³¹⁰ COM06 Final Report, paras 49-51, CMM 2021-08, paras 6-10.

³¹¹ COM06 Final Report, para 52.

³¹² CMM 2021-08, para 15.

³¹³ SWG-MSE-PS-1, para 15.

³¹⁴ SWG-MSE-PS-1, para 29, 35 and Annex D.

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Convention Area from expanding beyond the “existing historical level”.³¹⁵ Members with historical, but no current, harvest of Sablefish in the eastern part of the Convention Area, are constrained from expanding their fishery.³¹⁶ Any development of new fishing activity is to be determined in accordance with the Convention and, if in areas of national jurisdiction adjacent to the eastern part of the Convention Area, in accordance with the Exploratory Fishing Protocol attached to the CMM.³¹⁷ In the case of Chub mackerel, Members are required to refrain from expansion of their flag fishing vessels authorized to fish for Chub mackerel in the Convention Area from the historical existing level until the stock assessment by the SC has been completed.³¹⁸ Other Members without substantial harvest of Chub mackerel in the Convention Area are encouraged to refrain from expansion.³¹⁹

4.4.3. *New entrants – fishing opportunities*

224. At COM06 in 2021, following review of the EU’s updated Fisheries Operation Plan by the SC and TCC, Members invited the EU to accede to the NPFC Convention by consensus.³²⁰ Nevertheless, some Members remained apprehensive regarding the EU’s Plan, including the size and capacity of the proposed EU trawler, the potential impact of the EU’s proposed fishing activities on the Chub mackerel stock, and potentially on other pelagic species, and the proposed area of fishing operations. Japan, support by China, proposed attaching conditions to the EU Fishing Operations, including with respect to the catch limit for Chub mackerel.³²¹ The EU’s Fisheries Operation Plan is still under consideration by the SC and TCC.³²²

4.4.4. *Review Panel’s findings*

225. The Review Panel notes that NPFC identified priority species for management and stock assessments and that, since the entry into force of the Convention, NPFC’s capacity and resources have been fully extended establishing the parameters for the sustainability of the priority fishery resources. The Review Panel was also aware that establishing agreements among NPFC Members on a TAC for Pacific saury and its allocation has been challenging and expects similar challenges for other priority species.
226. Although it is commendable that the Commission invited the EU to become a Contracting Party to the NPFC, the discussion within the Commission highlights the tension between the desirability of inviting new entrants to join a RFMO, and concerns over the impact of any resulting fishing activities on the sustainability target fishery resources.
227. Similar discussions are likely to occur in future in considering the development aspirations of small island developing States. (See also Section 7.4). In response to a proposal tabled by Vanuatu at COM06,³²³ the Commission is to consider the development aspirations of small island developing

³¹⁵ CMM 2019-10, para 2.

³¹⁶ CMM 2019-10, para 3.

³¹⁷ CMM 2019-10, paras 4 and 5 and Annex 1.

³¹⁸ CMM 2019-07, para 1.

³¹⁹ CMM 2019-07, para 2.

³²⁰ COM06 Final Report, paras 6-8. The latest EU Fisheries Operation Plan is contained in NPFC-2021-TCC05-OP1.

³²¹ COM06 Final Report, para 10, Annex D.

³²² COM06 Final Report, para 9.

³²³ COM06 Final Report, para. 49.

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States in revising the Pacific saury Measure.³²⁴ The process and timeline for this to occur was not elaborated but this will introduce additional factors into NPFC negotiations on allocation and fishing opportunities.

228. Future consideration of fishing opportunities in the Commission is likely to continue to be challenging while there remain no criteria for the allocation of fishing opportunities and there is no MP that could assist both with promoting the long-term sustainability of fisheries resources and with the allocation of fishing opportunities.

4.4.5. *The Review Panel's recommendations*

Recommendation 4.4.1. An agreed process for the allocation of fishing opportunities should be a long-term goal of the Commission.

4.5. Ecosystem approach to fisheries

4.5.1. *Background*

229. One of the principal drivers for the establishment of international arrangements for cooperation on the conservation and management of the fisheries resources of the North Pacific Ocean in 2005 was the motivation for States responsible for fisheries operations in the region to avoid inconsistencies with the provisions of UNGA Resolutions relating to bottom fishing and the protection of VMEs, particularly Resolution 61/105.³²⁵ In response, States participating in discussions that would eventually lead to the establishment of the NPFC considered the identification of VME indicator species and the assessment of SAI associated with bottom fisheries operating in the North Pacific Ocean as early as 2008 when the Interim Secretariat tabled draft standards and criteria to identify VMEs and to assess SAIs on VMEs and marine species to the fourth meeting of the SWG.³²⁶ At the same session, Russia presented three working papers³²⁷ on the likelihood of impacts on species associated with bottom trawl fisheries, including broad alfonsin, pencil cardinalfish, and dories³²⁸, net hang ups and net loss³²⁹ and data on the locations of incidental coral captures.³³⁰ SWG04 agreed that four Orders would be included in the list of corals for protection, to be reviewed and amended as necessary: Alcyonacea, Gorgonacea, Antipatharia, and Scleractinia. SWG04 also considered issues such as protocols for exploratory and new fisheries and the definition of an encounter with a VME.
230. On the advice provided through the SWG04, the Fifth Intergovernmental Meeting in December 2008 adopted “New Mechanisms for the Protection of VMEs and Sustainable Management of

³²⁴ CMM-2021-08, para. 17.

³²⁵ UNGA Resolution 61/105. “Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments”.

³²⁶ 4th Scientific Working Group Meeting, SWG4/WP6.

³²⁷ 4th Scientific Working Group Meeting, SWG4/WP 16, 17 and 18.

³²⁸ Other bycatch in North Pacific bottom fishing operations reported to the Scientific Committee include: Oreo (*Allocyttus verrucosus*), Butterfish (*Hyperoglyphe japonica*), Mirror dory (*Zenopsis nebulosa*) and Rockfish (*Sebastidae spp.*) (SSC NPA2 Summary Report, 2017).

³²⁹ 4th Scientific Working Group Meeting, SWG4/WP20.

³³⁰ 4th Scientific Working Group Meeting, SWG4/WP19.

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High Seas Bottom Fisheries in the Northwestern Pacific Ocean”³³¹, “Draft Standards for an Observer Program” (for bottom fisheries)³³², the SWG’s “Review of Procedures for the Bottom Fishing Activities”³³³ and “Science-based standards and criteria for identification of VMEs and assessment of SAI on VMEs and marine species”.³³⁴

231. A proposed field guide for the identification of deep-water corals submitted by the United States³³⁵ and Japan’s assessment and proposed interim measures for its bottom trawl fishery³³⁶, and bottom gillnet fishery³³⁷, taking account of associated and dependent species, and the need to protect VMEs, were discussed at SWG05. The United States also presented its assessment of information relating Southern Emperor and Northern Hawaiian Ridge (SE-NHR) fisheries, their impacts on target, associated and dependent species, and on benthic habitats.³³⁸
232. At the Sixth Intergovernmental Meeting, an “Exploratory Fishery Protocol”, forwarded by the SWG06, and the consequential changes to the “New Mechanism for Protection of VMEs and Sustainable Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean (Interim Measures)” were adopted. The Meeting was unable to finalize a “VME Encounter Protocol” forwarded by SWG06 because of disagreement over the threshold for triggering the protocol, in terms of quantity of indicator species, and proposals to close areas of seamounts (Colahan, C-H and Koko).
233. SWG07 in 2009 focused on new footprint data for bottom fishing operations, data sharing and future collaboration on an assessment of North Pacific armorhead, the definition of an encounter with VMEs (continued without resolution at SWG08 in 2010) and the possible extension of the “Interim Measures” to the entire North Pacific. Other than discussion on the extension of the “Interim Measures” to the entire North Pacific (other than FAO Area 61), “Interim Measures” did not receive substantive discussion in subsequent Intergovernmental Meetings in 2009 nor 2010.
234. The 10th Intergovernmental Meeting met in 2011 and adopted revised “New Interim Measures for the Protection of VMEs in the Northeast Pacific Ocean” and agreed on a definition of VMEs for the purposes of the “Interim Measures in the Northeast and Northwest Pacific” including the “Exploratory Fishery Protocol”. SWG09 considered VME encounter definitions and protocols and estimated catch rates for species of coral associated with the four Orders agreed at SWG04. SWG10 considered the outcomes of work undertaken by the Intersessional Working Group created to develop encounter protocols on VMEs in the Convention Area at the 10th Intergovernmental Meeting which highlighted i) the limited data that had been provided by participants, and ii) a lack of consensus among participants on next steps.
235. SWG11 continued discussion on the development of VME encounter protocols and considered the summary report from the SWG on science priorities for NPFC,³³⁹ which had been developed during the Fourth Session of the Preparatory Conference. SWG11 agreed that it would focus on

³³¹ 4th Scientific Working Group Meeting, SWG4/NWPBF5/WP15/Rev3.

³³² 4th Scientific Working Group Meeting, SWG4/WP10/Rev.

³³³ 4th Scientific Working Group Meeting, SWG4/WP11/Rev.

³³⁴ 4th Scientific Working Group Meeting, SWG4/NWPBF5/WP6/Rev.2.

³³⁵ 5th Scientific Working Group Meeting, December 2008.

³³⁶ 5th Scientific Working Group Meeting, SWG5/WP7/J1.

³³⁷ 5th Scientific Working Group Meeting, SWG5/WP7/J2.

³³⁸ 5th Scientific Working Group Meeting, SWG5/WP7/US.

³³⁹ 11th Scientific Working Group Meeting, SWG11/WP6.

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the four previously identified priority species (North Pacific armorhead, Splendid alfonsino, Pacific saury and squid) and that fisheries data should be submitted in accordance with the annual report format developed for the NPFC at the Third Session of the Preparatory Conference. The SWG agreed that data should be provided for all areas relevant to the assessment of a particular stock, including the high seas and waters under national jurisdiction.³⁴⁰

236. This background demonstrates that, for almost 10 years prior to the entry into force of the Convention, future NPFC participants were engaged in detailed discussion of a range of complex ecosystem-related issues associated with bottom fisheries operating in the Convention Area. On the other hand, there is little evidence that ecosystem issues associated with pelagic fisheries in the Convention Area was considered during this period.

4.5.2. *The ecosystem-related provisions of the Convention*

237. The Convention includes a significant number of obligations and actions associated with North Pacific marine ecosystem. Among other principles and background, the preambular paragraphs of the Convention make numerous references to international legal frameworks such as the UN Fish Stocks Agreement and the outcomes of negotiations in the United Nations (such as Resolutions 61/105, 64/72 and 60/31) relating to safeguarding marine ecosystems. It includes the protection of VMEs and associated species from SAIs of destructive fishing practices and the need to avoid adverse impacts on the marine environment, to preserve biodiversity, to maintain the integrity of marine ecosystems, and to minimize the risk of long-term or irreversible effects of fishing operations.

238. This is reinforced in Article 2 which states that the Objective of the Convention is:

to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur.

239. The Convention provides that the Objective described at Article 2 will be achieved by adopting and implementing measures in accordance with the precautionary approach and an ecosystem approach to fisheries, and in accordance with the relevant rules of international law³⁴¹. Elaborated at Article 3, Parties will take actions that include the assessment of impacts of fishing activities on species belonging to the same ecosystem or dependent upon or associated with the target stocks. Individually or collectively, as appropriate, actions shall include the adoption of CMMs to maintain or restore populations of species above levels at which their reproduction may become seriously threatened³⁴², protecting biodiversity in the marine environment³⁴³, ensuring that any expansion of fishing effort, development of new or exploratory fisheries, or change in the gear used for existing fisheries, does not proceed without appropriate assessment³⁴⁴, and minimizing pollution and waste, discards, catch by lost or abandoned gear, and impacts on other species and

³⁴⁰ SWG07 Final Report, Item 7.

³⁴¹ Convention, Article 3(c).

³⁴² Convention, Article 3(d).

³⁴³ Convention, Article 3(e).

³⁴⁴ Convention, Article 3(h).

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marine ecosystems through measures including, to the extent practicable, the development and use of selective, environmentally safe, and cost-effective fishing gear and techniques.³⁴⁵

240. The functions of the Commission in this regard, detailed at Article 7, provides for the adoption, where necessary, of CMMs for species belonging to the same ecosystem or dependent upon or associated with the target stocks³⁴⁶ including to prevent SAI on VMEs³⁴⁷ and management strategies for any fisheries resources and for species belonging to the same ecosystem or dependent upon or associated with the target stocks.³⁴⁸
241. In undertaking these functions, the Commission will seek the SC's advice.³⁴⁹ It will also establish the terms and conditions for any experimental, scientific, and exploratory fishing activities on fisheries resources, VMEs, and species belonging to the same ecosystem or dependent upon or associated with the target stocks.³⁵⁰ A list of indicator species for VMEs for which directed fishing shall be prohibited will also be maintained.³⁵¹
242. To support the Commission in this endeavour, Article 10 of the Convention provides that the SC will, *inter alia*, assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks,³⁵² including processes and criteria to identify VMEs, where they occur or are likely to occur, and the location of bottom fisheries in relation to these areas or features,³⁵³ establish science-based standards and criteria to determine if bottom fishing activities are likely to produce SAIs on VMEs or associated marine species and make recommendation for measures to avoid such impacts,³⁵⁴ identify and advise the Commission on additional indicator species for VMEs for which directed fishing shall be prohibited,³⁵⁵ review any assessments, determinations and management measures and make any necessary recommendations in order to attain the objective of the Convention³⁵⁶.
243. Further, Article 13(5) of the Convention requires each Member to prohibit its vessels from engaging in directed fishing on the following Orders: Alcyonacea, Antipatharia, Gorgonacea, and Scleractinia, as well as any other indicator species for VMEs identified by the SC and adopted by the Commission.
244. In addition, the Convention requires the Commission to cooperate with other organizations that have competence in relation to areas adjacent to the Convention Area or in respect of fisheries resources not covered by the Convention, species belonging to the same ecosystem or dependent upon or associated with the target stocks, and that have objectives that are consistent with and supportive of the objective of the NPFC Convention.³⁵⁷

³⁴⁵ Convention, Article 3(k).

³⁴⁶ Convention, Article 7(1)(c).

³⁴⁷ Convention, Article 7(1)(e).

³⁴⁸ Convention, Article 7(1)(d).

³⁴⁹ Convention, Article 7, Article 7(3)(c).

³⁵⁰ Convention, Article 7, Article 7(3)(d).

³⁵¹ Convention, Article 7, Article 7(3)(e).

³⁵² Convention, Article 7, Article 10(4)(d).

³⁵³ Convention, Article 7, Article 10(4)(e).

³⁵⁴ Convention, Article 7, Article 10(4)(f).

³⁵⁵ Convention, Article 7, Article 10(4)(g).

³⁵⁶ Convention, Article 7, Article 10(4)(h).

³⁵⁷ Convention, Article 21 (2 and 3).

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4.5.3. Ecosystem-related considerations since the Commission was established

245. Consistent with the Objective of the Convention concerning the protection of the marine ecosystems of the North Pacific in which fishery resources occur (Article 2), the Commission continued to dedicate significant attention to adverse impacts of bottom fisheries on VMEs once the Convention entered into force in 2015. There was no substantive discussion of ecosystem-related matters at COM01 but the Commission did adopt the consolidated recommendations of the SWG.³⁵⁸ At COM02, in 2016, the Commission discussed two proposals: A “CMM for Bottom Fisheries in the Northwestern Pacific Ocean”³⁵⁹ and a “CMM for Protection of VMEs in the North-eastern Pacific Ocean”.³⁶⁰ Based on the discussion, COM02 adopted CMM 2016-05 “CMM for bottom fisheries and protection of VMEs in the Northwestern Pacific Ocean”³⁶¹ and CMM 2016-06 “CMM for bottom fisheries and protection of VMEs in the North-eastern Pacific Ocean”³⁶². Both CMM 2016-05 and 2016-06 include the following annexes:
- Annex 1: An “Exploratory Fisheries Protocol” in the North Pacific Ocean which is based on the principal of a precautionary approach and specifies the data and information to be collected in association with new and exploratory fisheries.
 - Annex 2: which describes “Science-based standards and criteria for identification of VMEs and assessment of SAI on VMEs and marine species” including a sub-annex that provides examples of potential VME species groups, communities, and habitats as well as features that potentially support them and a template for reporting VME encounters.
 - Annex 3: which describes the “Scientific Committee’s assessment review procedures for bottom fishing activities”.
 - Annex 4: which provides the format of national report sections on development and implementation of scientific observer programs.
 - Annex 5: which describes “NPFC Bottom Fisheries Observer Program Standards: Scientific Component”. This details the type and format of scientific observer data to be collected. Section G of this Annex details “Data to be collected on Incidental Captures of Protected Species” including details of encounters with marine mammals, seabirds and reptiles.
246. TCC01 in 2016 considered a Technical and Compliance Committee Framework proposed by Canada.³⁶³ The purpose of the Framework was to prioritize the work of the Commission and its subsidiary bodies over the following 5 years.³⁶⁴ TCC01 endorsed the Framework³⁶⁵ which was subsequently adopted as part of the TCC Report to COM02.³⁶⁶
247. The FAC considered the Secretariat’s work plan for 2017 at COM03. The Plan advised that the Secretariat was expected to support the SC in implementation of its Five-Year Research Plan which, *inter alia*, included “Stock assessments for target fisheries and bycatch species” and an “ecosystems approach to fisheries management”. It also provided for the Secretariat to “assist

³⁵⁸ COM01 Final Report, para 7.

³⁵⁹ NPFC-2016-TCC01-WP08 (Rev 2a).

³⁶⁰ NPFC-2016-TCC01-WP08 (Rev. 2b).

³⁶¹ COM02 Final Report, Annex P.

³⁶² COM02 Final Report, Annex Q.

³⁶³ NPFC-2016-TCC01-WP03.

³⁶⁴ TCC01 Final Report, Annex E.

³⁶⁵ TCC01 Final Report, para 25.

³⁶⁶ COM02 Final Report, para 17.

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Members in standardization of bycatch species list and fish species identification guides”. These provisions have been maintained in the Secretariat’s annual work plan since.³⁶⁷

248. SC05 in 2020 endorsed the recommendation of the TWG CMSA that reporting requirements be changed such that Convention Area Chub mackerel fisheries be required to report bycatch of pelagic species (in weight or numbers, by species).³⁶⁸
249. TCC05 in 2021 considered a Fisheries Operation Plan that the EU had submitted to the Commission to describe its intentions regarding fishing for Chub Mackerel in the Convention Area should its application to accede to the Convention be successful³⁶⁹. At that session of TCC, some Members expressed concern about how to accommodate the EU’s fishing interests with those of existing Members of the NPFC who have historically fished for Chub mackerel in the Convention Area, and with the need to ensure the long-term sustainability of Chub mackerel, as well as in relation to bycatch mitigation of species other than fish³⁷⁰.
250. While COM02’s adoption of CMMs for bottom fishing and the protection of VMEs was the culmination of considerable work under the auspices of the SWG over many years, the reference to bycatch in the Framework endorsed by TCC, and adopted by the Commission at its second meeting, was the first formal acknowledgement by the Commission of future work relating to broader ecosystem considerations in pelagic fisheries in the North Pacific Ocean.
251. Although included on the agenda for discussion at TCC02 in 2017, apart from reference to a ‘framework’ associated with VMS, there was no further reference to the TCC Framework in TCC02 or following sessions of TCC. The subject appears to have been superseded by consideration of a TCC work plan. COM03 that year did discuss uncertainty associated with bycatch of Pacific saury in NPFC fisheries, but bycatch of species other than those identified as priority NPFC fishery resources and broader ecosystem considerations, as provided for at Article 2 of the Convention, appears to have received no attention.
252. With respect to the Secretariat’s work plans, while the Secretariat has certainly supported the SC in implementation of its Research Plan concerning stock assessments for target fisheries resources little attention has been applied to the bycatch related provisions of the Secretariat’s work plan.
253. Regarding the proposed Fisheries Operation Plan submitted in association with the EU’s intention to fish for Chub mackerel, the Review Panel was unable to verify that the level of concern expressed in the report of the TCC05 meeting in relation to the EU proposal with respect to bycatch is replicated in the practice that applies to the Chub mackerel fisheries of Members. As far as the Review Panel is aware, no concern has been expressed about bycatch of non-priority species by Members fishing for Chub mackerel.

4.5.3.1. The Review Panel’s findings

254. The Review Panel concludes that despite the acknowledgement of obligations associated with bycatch and broader ecosystem considerations through the adoption of various plans or

³⁶⁷ COM06 Final Report, Annex D.

³⁶⁸ SC05 Final Report, paras 16 (d) and 64.

³⁶⁹ NPFC-2021-TCC05-OP01.

³⁷⁰ TCC05 Final Report, para 12.

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frameworks, the Commission, its subsidiary bodies, and the Secretariat have focused their attention on priority fishery resources to date.

255. The Panel assesses that the NPFC has currently insufficient capacity to simultaneously implement plans and strategies relating to bycatch and broader ecosystem considerations and that progress addressing bycatch and broader ecosystem issues in NPFC will remain limited without the allocation of additional institutional resources.

4.5.4. Ecosystem-related provisions of the Scientific Committee's Research Plans

256. The Scientific Committee's three Research Plans (2015-2017, 2017-2021 and 2021-2025) share three priority research areas:

1. Stock assessments for target fisheries and bycatch species
2. Ecosystem approach to fisheries management
3. Data collection, management, and security.

257. The Plans state that, in relation to an ecosystem approach to fisheries management, areas of work will include:

- Formulation of a work plan on how to implement the ecosystem approach to fisheries management in the Convention Area
- Vulnerable Marine Ecosystems
- Ecological interactions among species
- Ecosystem modelling
- The evaluation of impacts of fishing on fisheries resources and their ecosystem components, including bycatch species
- Other issues related to marine ecosystems including marine debris and pollution.

258. Consistent with Article 10 of the Convention, the 2017-2021 and 2021-2025 Research Plans provide, *inter alia*, for the review of existing NPFC standards on VME identification and data collection, including encounter protocols, determination of data requirements and identification of what data may be collected through commercial fishing operations, visual surveys of VMEs and development of a framework to conduct assessments of the impacts of bottom fishing on VMEs. The Research Plans advise that key work for the 2021-2025 period will include the development of combined bycatch taxa list and approval of a fish ID guide for scientific observers in the NW Pacific Ocean. Specific to action items associated with an ecosystem approach to fisheries management, the SC proposes that each year of the Plan will be concerned with understanding the ecological interactions among species and evaluating the impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards³⁷¹. SC04 in 2019 agreed to establish a SWG for the development of the combined bycatch taxa list for the Convention Area and the development of the fish identification guide for scientific observers for the North-western Pacific Ocean. The SC included this work in its work plan and its list of scientific projects.³⁷²

259. The SC Research Plan provides that, between 2021 and 2025, Members will evaluate the impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and

³⁷¹ See discussions on the 2017-2021 Research Plan at SC3 regarding the importance of bycatch issues reported to COM04 (COM04 Final Report, para 32).

³⁷² SC04 Final Report, paras 13, 17, Annex G and F respectively.

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discards. The Plan also provides that data will be collated for bycatch species associated with Blue mackerel, Japanese sardine, Neon flying squid and Japanese flying squid fisheries and that baseline stock assessments of associated bycatch species will be developed.³⁷³

4.5.5. *The Review Panel's findings in relation to ecosystem-related considerations*

260. The Review Panel notes that an ecosystem approach to fisheries in the NPFC context has two distinct applications. One, implemented on entry into force of the Convention as an immediate response to the UNGA Resolutions, concerned bottom fisheries and the protection of VMEs in the North Pacific Ocean. The second concerns ecosystem considerations in pelagic fisheries.
261. In relation to bottom fishing, the Panel compliments the SC and the Commission for the scope and intent provided in the historic and current conservation measures relating to bottom fishing and the protection of VMEs (CMM 2021-05 and 2021-06 and their predecessors). However, the actual implementation of these measures does raise some issues requiring further review.
262. The Review Panel notes that there has never been a report of an encounter retrieving more than 50kg of VME³⁷⁴. This suggests that i) there are no VMEs in the areas fished (which is contrary to research and survey reports), and/or ii) that the threshold is too high relative to a low density of VME's, and/or iii) that VMEs are present but the fishing gear does not retain VME encounters for the full retrieval of gear, and/or iv) vessels and/or observers are not complying with reporting obligations. A review of the scientific aspects of the 50kg threshold was suggested at COM04.³⁷⁵ Without an independent and impartial observer program, in combination with the absence of deterrents to non-compliance,³⁷⁶ the current VME encounter reporting procedure appears ineffective and potentially undermines the objective of the Measures.
263. The second issue identified by the Review Panel concerns attention to the second part of the Objective of the Convention (Article 2) and the expressed intent for the implementation of the Convention to not only ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area but that this is to be achieved while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur. In this regard, the assessment of the Review Panel is that ecosystem considerations in NPFC pelagic fisheries have received inadequate attention.
264. The Review Panel considers that the ecosystem-related provisions of the SC's Research Plans are relevant and appropriate. However, in regard to bottom fisheries and VMEs, in the Panel's assessment, there is no detail provided in either the Plan itself, nor in reports of annual meetings of the SC on the status of the Research Plan, which demonstrate that the actions provided for in the Plans are being attended to. Relevant actions reported by the SC are sparse and, apart from new proposals tabled by Canada in 2022 for initial consideration at the next TCC meeting, one related to shark finning³⁷⁷ and the other concerned with pollution,³⁷⁸ there is little evidence that

³⁷³ Refer SC06 Final Report, Annex I.

³⁷⁴ CMM 2021-05, para G and CMM 2021-06, para 3(j).

³⁷⁵ Refer to the Report of SC03 to COM04 (COM04 Final Report, para 11).

³⁷⁶ The Review Panel was unable to collect information relating to reported infringements or prosecutions associated with non-compliance with these measures at the national level.

³⁷⁷ NPFC-2022-TCC06-WP20.

³⁷⁸ NPFC-2022-TCC06-WP19.

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ecosystem considerations in NPFC fisheries are receiving strategic attention either at the national, or Commission, level.³⁷⁹

265. In discussions with NPFC stakeholders regarding this situation, several explained that the NPFC is a relatively small regional fisheries management body, with limited resources, and current efforts are focused on establishing effective conservation and management arrangements for priority fishery resources. In addition, the Review Panel was advised that, as most of NPFC fisheries use fishing gears with relatively high selectivity, bycatch of non-target species is not considered to be a major problem. Nevertheless, as one example, anonymous responses to the Review Panel's questionnaire reported that shark finning by NPFC authorised fishing vessels operating in the Convention Area has been identified by inspection vessels.
266. As the Commission approaches the end of its first decade, the inability to transparently verify the interaction of NPFC fisheries with species belonging to the same ecosystem or dependent upon or associated with the target stocks is not sustainable in the medium term. Nor is it defensible that these issues are sufficiently addressed in RFMOs with contiguous or overlapping areas of competence and therefore no action is required of NPFC. There should be efforts to focus on data collection procedures and obligations so that ecosystem-related interactions in NPFC pelagic fisheries can be characterized and assessed. Additional effort is also required to encourage Members to ensure compatible initiatives are supported and implemented in areas under national jurisdiction, with outcomes reported to the Commission.
267. A third matter concerns the provisions of the two bottom fishing and protection of VME Measures both of which contained significant detail relating to scientific reporting and monitoring procedures. While it is understandable that a variety of initiatives were consolidated in a single Measure in the early years of the Commission, the Review Panel proposes that the Commission consider separating provisions relating to target fishery resources (North Pacific armorhead and Splendid alfonsino) and some of the annexes that remain in the two CMMs and adopt them as either i) standalone CMMs, or ii) as policies or guidelines.
268. Candidate annexes for consideration include the "Exploratory Fishery Protocol", the "Science-based standards and criteria for identification of VMEs and assessment of SAIs on VMEs and marine species" and the "Scientific Observer Program". Successful completion of this exercise would streamline review and refinement in relation to the substantive CMM itself. In addition, in relation to the Scientific Observer Program, it would provide a sound foundation for eventual extension of the observer program to all NPFC fisheries.
269. In response to a proposal from the SSC VME3, SC03 agreed to continue working on, among other tasks, a review of the deep-sea bycatch species and that sponges and hydrocorals be assessed for SAIs in the Convention Area as VME indicator taxa.³⁸⁰ Substantive discussion of this proposal was not recorded in the report of SC04 although that session did revise the data to be recorded by scientific observers by deleting the requirement to maintain a "Record of sensitive benthic species in the trawl catch, particularly vulnerable or habitat forming species such as sponges, sea-fans or

³⁷⁹ For example, the task of the small working group established in 2019 to develop a combined bycatch taxa list and fish identification guide for scientific observers is incomplete as is the collation of data for bycatch species associated with Spotted mackerel, Japanese sardine, Neon flying squid and Japanese flying squid fisheries and baseline stock assessments for associated bycatch species.

³⁸⁰ SC03 Final Report, paras 32, 45.

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corals”. Despite this, the requirement of the SC to “develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a VME” was retained.³⁸¹ The Review Panel encourages the SC to re-visit the recommendations of SC03 and SSC VME3,³⁸² and provide a transparent assessment of the value of including sponges and hydrocorals as VME indicator taxa in conjunction with Canada’s initiative to develop a quantitative method for the identification of VMEs in the North Pacific Ocean³⁸³.

270. Other than the Canadian proposals that were scheduled for discussion in 2022, the Commission has no CMMs relating to general environmental protection³⁸⁴, including measures associated with i) pollution and waste, ii) lost and discarded fishing gear³⁸⁵, or iii) interactions with marine mammals, seabirds or sharks (particularly in relation to shark finning). As many RFMOs have implemented Measures covering these subject areas it should be possible for NPFC to draw on the experience in other RFMOs to develop relevant Measures covering these issues for the NPFC Convention Area with relatively little effort.
271. In addition, unlike many other RFMOs, NPFC has no measure concerning fishing with long driftnets consistent with UN Resolutions 44/225, 45/197 and 46/215. SPRFMO has prohibited the use of large-scale pelagic driftnets and demersal fishing with gillnets in the Convention Area.³⁸⁶ CCAMLR also adopted a Resolution relating to the prohibition driftnet fishing in the Convention Area in 1990,³⁸⁷ and, in 2010, adopted an interim prohibition on deep sea gillnetting near the surface, in midwater or on the bottom.³⁸⁸ In the North Pacific, NPAFC supports *Operation Driftnet* to enforce the United Nations ban on high seas driftnets. Many NPFC members participate in these organizations. The absence of an equivalent NPFC measure is despite TCC receiving evidence of the presence of long driftnets on vessels fishing in the Convention Area. The vessels concerned have been maintained on the NPFC IUU List for the period 2017-2021. To enhance NPFC’s international reputation as a competent RFMO, and harmonize NPFC provisions with global practice, the Review Panel encourages the Commission to incorporate action to address these deficiencies on the work program of the appropriate subsidiary bodies with a timeline for the adoption of appropriate CMMs.
272. Finally, although there is evidence of range shifts for priority NPFC fishery resources there is little indication that either the Commission, or the SC, has developed a strategy to formally assess the potential impacts of climate change on North Pacific fisheries and implications for the work and decisions of NPFC. There is no reference to climate-related research in the SC’s Research Plan (2021-2025). The only apparent references to climate-related matters in recent Reports from the

³⁸¹ SC04 Final Report, Annex 5.

³⁸² SC03 Final Report. para 45.

³⁸³ Reported in a response to the Review Panel’s questionnaire.

³⁸⁴ Similar to CCAMLR’s CM 26-01

³⁸⁵ As noted by an anonymous source among the responses to the Review Panel’s questionnaire, outside of the voluntary language in the Sablefish measure (CMM 2019-10), NPFC has not implemented measures relating to abandoned/lost fishing gear in the Convention Area. This is in spite of the issue being documented on numerous occasions (for example, see NPFC-2020-SSC BFME01-WP08, NPFC-2020-SSC BFME01-WP12, FAO Report on NPFC-FAO VME Meeting 2018).

³⁸⁶ CMM 08-2019.

³⁸⁷ Resolution 7/IX.

³⁸⁸ CM 22-10.

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SC or Commission are in the bibliographic sections of some of the species' profiles in the SC6 Summary Report³⁸⁹ and in discussions relating to possible areas of cooperation with other organizations (PICES and FAO).³⁹⁰

4.5.6. Review Panel's recommendations

Recommendation 4.5.1. The implementation of the CMMs relating to bottom fishing and the protection of VMEs should be strengthened by requesting the:

- i) SC to undertake a review of the scientific aspects of the 50kg VME encounter threshold (including practices in other RFMOs) for possible revision;
- ii) SC to re-visit the recommendations of SC03 and SSC VME03 and provide a transparent assessment of the value of including sponges and hydrocorals as VME indicator taxa in conjunction with supporting an initiative to develop a quantitative method for the identification of VMEs; and
- iii) TCC to develop compliance-related reporting provisions for the Scientific Observer Program related to VME encounters, accompanied by a mechanism to deter non-compliance.

Recommendation 4.5.2. That the Commission and the SC develop strategies that address the lack of information needed to take ecosystem considerations into account for NPFC pelagic fisheries in the Convention Area, and include these in the SC's Research Plan, data collection procedures and obligations to better take into account ecosystem-related interactions, and how they might compare with compatible initiatives in areas under national jurisdiction.

Recommendation 4.5.3. That the Commission, at an early opportunity, develop and adopt CMMs addressing lost and discarded fishing gear, marine pollution and waste from fishing vessels, interactions with marine mammals, seabirds or sharks (particularly a prohibition on shark finning), and a prohibition on fishing with long driftnets in the NPFC Convention Area.

Recommendation 4.5.4. That the Commission recognize the importance of taking into account the known and anticipated impacts of climate change on the North Pacific Ocean ecosystem, including with respect to changes in the geographic and temporal distribution of stocks, notably Pacific saury.

Recommendation 4.5.5. That the SC make appropriate provision in its current Research Plan to address current deficiencies associated with addressing the impacts of climate change on NPFC ocean ecosystems and associated fisheries.

5. Compliance and Enforcement

5.1. Introduction

273. As one of the core principles and actions in giving effect to the objective of the NPFC Convention (the Convention), Article 3 (j) includes “[e]nsuring compliance with conservation and management measures and that sanctions applicable in respect of violations are adequate in severity to be effective in securing compliance, to discourage violations wherever they occur and

³⁸⁹ SC06 Final Report, Annex F and Annex N.

³⁹⁰ COM06 Final Report, paras 41 and 58 respectively.

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to deprive offenders of the benefits accruing from their illegal activities.” The decisions, measures and processes to ensure and support compliance with existing rules are a central aspect of RFMOs’ performance, and NPFC is no exception.

274. Consistent with the principle and actions stated in Article 3(j), some of the critical functions of the NPFC Commission concern ensuring compliance and enforcement with the Convention and existing CMMs. Under Article 7(2), one of the tasks of the Commission is to “adopt measures to ensure effective MCS”, as well as “compliance with and enforcement of” the provisions of the Convention and the measures adopted according to it. The same provision provides that, to such end, the Commission shall adopt decisions and develop procedures concerning (a) the regulation and monitoring of transshipments, (b) the establishment of an Observer Program, (c) boarding and inspection procedures, (d) cooperative mechanisms to ensure effective MCS and to prevent, deter and eliminate IUU fishing, (e) standards for reporting movements and activities using real-time satellite position-fixing transmitters for vessels, (f) procedures to notify entry into and exit from the Convention Area of fishing vessels, (g) market-related measures to prevent, deter and eliminate IUU fishing, and (h) procedures for reviewing compliance with the provisions of the NPFC Convention and the measures adopted under it.
275. In addition to the above, Article 13 describes the flag State duties. Members must not allow their vessels to operate in the Convention Area unless authorised by the appropriate national authority and must not conduct unauthorised fishing activities. Some of these duties are stated generally and must be further developed and implemented by decisions the Commission should adopt under Article 7(2) described above. They include the need to use real-time satellite position-fixing transmitters in the Convention Area, notify the Commission of the location of any transshipment of fisheries resources, place observers on board and the duty to accept boarding and inspection. Article 13(10) tasks the Commission to establish and maintain its record of fishing vessels.
276. Equally, Article 14 recognizes the rights and duties of coastal States to adopt measures to regulate the entrance and use of their ports. Each Member must “give effect to port State measures adopted by the Commission in relation to the entry and use of its ports by fishing vessels that have engaged in fishing activities in the Convention Area”, including for such matters such as landing and transshipment of fisheries resources, inspections of fishing vessels, documents, catch and gear on board, and use of port services.
277. Finally, under Article 17, on “Compliance and Enforcement”, each Commission Member is obligated to enforce the provisions of the Convention and any relevant decisions of the Commission. Members must investigate thoroughly any allegation that fishing vessels entitled to fly their flag have violated any of the provisions of the Convention or any CMM adopted by the Commission and take actions accordingly.
278. In assessing the NPFC’s performance related to compliance with, and enforcement of, the Convention and the Measures adopted under it, the Review Panel has considered two main issues. First, the manner and extension to which the NPFC has implemented the tasks imposed by the Convention in Articles 7(2), 13, 14 and parts of Article 17, all of which are aimed at ensuring Contracting Parties’ compliance with the Convention and the management measures adopted by the Commission. Second, after gathering information from meeting reports and documents, the Performance Review questionnaires, interviews with stakeholders and other sources, the Panel also considered how NPFC addresses incidents of non-compliance.

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279. The Review Panel found it challenging to assess the second issue identified above, i.e., how Members and CNCs respond to cases of non-compliance. As is often the case in RFMOs, specific information on such matters is not always available or openly reflected in meeting reports. This is a matter that would likely improve once the NPFC Compliance Monitoring Scheme (CMS), adopted in 2019, becomes fully operational. That said, the Review Panel was able to use the information available to provide some specific commentary and recommendations in regard to compliance and enforcement.
280. The general conclusion is that the NPFC has much room for improvement on matters related to compliance and enforcement. NPFC has made some advances in recent years to adopt decisions, management measures and procedures to implement some key provisions of the Convention relating to these matters. However, the Review Panel believes that, notwithstanding NPFC being the youngest RFMO, it still lags behind other organizations in some critical aspects. They include the adoption of specific measures to support matters concerning MCS, impacting its overall performance to address actual incidents of non-compliance.
281. Article 7(2)(d) of the Convention also tasks the Commission to establish appropriate cooperative mechanisms for effective MCS to ensure enforcement of the CMMs adopted by the Commission, including means to prevent, deter and eliminate IUU fishing. Cooperation with other international organizations and RFMOs is a topic that Chapter 7 addresses.

5.2. Monitoring, Control and Surveillance measures

282. Article 7(2) of the Convention states that the Commission shall establish “appropriate cooperative procedures for effective MCS of fishing and to ensure compliance with this Convention and the CMMs adopted by the Commission”.
283. In some respects, the Commission has been a leading RFMO in relation to the development and implementation of MCS measures. For example, it can boast an active scheme of high seas boarding and inspections which few other RFMOs have been able to implement. However, at the same time, NPFC has been slow to adopt some critical decisions to create the framework for a systematic and holistic MCS set of measures. In recent years, the Commission has made progress in implementing the tasks Article 7(2) mandates, including establishing a VMS system and adopting a framework for assessing compliance through a CMS. Yet considerable work is still required to demonstrate a solid commitment to Article 7(2) and other critical provisions of the Convention. NPFC lacks, for example, comprehensive measures to regulate transshipments, a regional Observer Program and common minimum standards for port State measures.
284. NPFC is aware of these shortcomings. In 2017 the TCC Small Working Group on Assessing Compliance started work with the aim of, among other things, defining TCC priorities. This SWG identified “a desire among Members to prioritize compliance reviews”.³⁹¹ Since then, the TCC and the Commission have made significant efforts to move forward with the adoption of MCS tools. However, only some MCS measures have been adopted and implemented. The Performance Review questionnaires also indicated awareness of the lack of a comprehensive system of MCS measures, as all responses indicated that NPFC has only “partially” adopted such measures and concluded that there are additional MCS measures needed.

³⁹¹TCC03 Final Report at p. 5.

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285. However, adopting MCS measures is not enough. Effective MCS measures must be adapted and customised to monitor and ensure compliance with NPFC’s needs to detect and identify violations of the Measures that have been adopted. Responses to the questionnaires, in general, suggest that the Commission’s set of MCS measures needs more development to serve the overarching goal of detecting violations and ensuring compliance with the Convention and existing CMMs. The Review Panel finds that some of the tools established or currently in development must be further developed or improved. The Commission should also add other mechanisms to deter violations and ensure compliance. The Review Panel recommends that Members and CNCPs continue to develop a holistic system of MCS measures
286. The following sections present the Review Panel’s assessment of the development and implementation of MCS measures in line with Article 7(2) and other specific provisions of the Convention.

5.2.1. Regulation of transshipments

287. Transshipment, or the direct transfer of any quantity of fish onboard from one vessel to another vessel regardless of the location of the event and without the fish being recorded as landed is a common practice in international fisheries that substantively reduces the costs of fishing operations.³⁹² However, when done without appropriate oversight, it can increase the risk of IUU-caught fish entering the supply chain and contribute to the overexploitation of fisheries resources, undermining sustainable fisheries and ocean conservation.³⁹³ The likelihood that transshipments will facilitate IUU fishing has been recognized in the NPFC context where there is evidence of vessels on the NPFC IUU Vessel List engaging in transshipments with unregulated carrier vessels.³⁹⁴ The potential link between transshipments and IUU fishing was specifically raised at the 2021 NPFC meeting.³⁹⁵
288. The risks associated with unregulated transshipments have prompted RFMOs to adopt management measures to set standards, conditions and procedural obligations, which States must fulfil in respect of vessels flying its flag and participating in transshipment. For example, IATTC, WCPFC and SPRFMO, regional organizations that regulate fishery resources in the Pacific, have all adopted rules to monitor and control this activity.³⁹⁶ In addition, in 2016, the FAO initiated a global process, which included an Expert Consultation, to develop draft voluntary guidelines for regulating, monitoring and controlling transshipments. A member-led negotiation process through the convening of a Technical Consultation followed, adopting the Voluntary Guidelines for Transshipments on 7 July 2022. The Guidelines are now awaiting endorsement by the Thirty-fifth session of COFI and subsequent reporting to the FAO Conference in October 2022.

5.2.1.1. The Review Panel’s assessment of transshipment

289. Article 7(2)(a) of the Convention mandates the Commission to adopt “procedures for the regulation and monitoring of transshipment of fisheries resources and products of fisheries resources taken in the Convention Area, including notification to the Commission of the location

³⁹²FAO Voluntary Guidelines for Transshipment adopted by the Technical Consultation on Voluntary Guidelines for Transshipment, June 2022.

³⁹³FAO 2020 *Transshipments: A Closer Look*, FAO Fisheries and Aquaculture Technical Paper No 661 at xiii.

³⁹⁴E.g. IUU Vessel List 2018, COM04 Final Report, Annex J, paras 189 to 193.

³⁹⁵COM06 Final Report, paras 5-6.

³⁹⁶See IATTC Resolution C-12-07, WCPFC CMM 2009-06, and SPRFMO CMM 12-2020.

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and quantity of any transshipment”. Consistent with this provision, Article 13(4)(c) requires flag States to notify the Commission of the location of any transshipment of fisheries resources and products of fisheries resources taken in the Convention Area, pending the adoption by the Commission of procedures for the regulation and monitoring of transshipments according to Article 7, subparagraph 2(a).

290. Transshipments have been subject to NPFC’s consideration since its early years. In 2016, at the 2nd Commission meeting, on the advice of the 1st session of the TCC, adopted “interim procedures”, for use by all Members and non-Member carriers to require them to submit the relevant information to the flag member (CMM 2016-03 on the Interim Transshipment Procedures for the NPFC). It established “the elements and procedures for the regulation and monitoring transshipment of fisheries resources or products of fisheries resources taken through bottom fishing”. Paragraph 1 of CMM 2016-03 states that this is “an initial step”. The CMM (paragraph 2a) also provides that the same transshipment reporting procedures “will apply to all vessels transshipping fisheries resources and products of fisheries resources that were harvested in the Convention Area, regardless of where the transshipment occurs”.
291. CMM 2016-03 contains some minimal requirements but is unfit for adequately regulating and monitoring transshipments. It requires offloading and receiving vessels to provide advance notice to the flag State, including the product being transhipped and information on the event’s location. There are obligations of reporting for both the offloading and receiving vessels within 15 days after a transshipment event takes place, whereby they must provide the flag State with information concerning the date and time of the event, position, product description and the port of expected and actual landing. However, the approach of CMM 2016-03 does not envisage, for example, the requirement of prior authorisation for vessels involved in transshipments, observation, electronic monitoring, or direct reporting to the Secretariat. The Secretariat only receives an annual report at the end of February each year concerning transshipments undertaken during the previous year. This is insufficient to monitor and understand the extent and possible risks associated with transshipments in the Convention Area.
292. In 2018, the TCC discussions highlighted that “while the NPFC has measures to control and monitor” transshipments, “they are less robust than those of other (RFMOs)”, and noted the need to strengthen measures to oversee these activities.³⁹⁷ Similar statements can be found in 2019, including recognition by the TCC and the request to the Commission to task the development of a “more robust CMM for Transshipment as a priority issue”.³⁹⁸ In 2021, the TCC noted “the need to prioritize work to design and implement a monitoring and control system for at-sea transshipment activities”, also “recognizing the growing global focus on transshipment issues and the fact that the NPFC is behind other RFMOs in this regard.”³⁹⁹
293. The lack of a comprehensive framework for monitoring transshipments in NPFC was exacerbated by the fact that, until recently, carrier vessels flagged to non-Members (with no CNCP status) were allowed to undertake transshipments with fishing vessels flagged to Members and CNCPs. Under this regime, Members and CNCPs could use non-Member carrier vessels included on the Interim Register in the Convention Area to receive transshipments of fisheries resources caught in the

³⁹⁷ TCC03 Final Report, para 3.

³⁹⁸ TCC04 Final Report, para 63.

³⁹⁹ TCC04 Final Report, para 10.

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Convention Area from fishing vessels flying the flag of Commission Members or CNCs. The NPFC Interim Register of non-Member Carrier Vessels was operational until 2019.

5.2.1.2. Review Panel's findings

294. Despite the provisions of the Convention relating to the establishment of procedures for the regulation and monitoring of transshipment of fisheries resources and the relevance of monitoring transshipments, there is as yet no comprehensive transshipment measure in place in the NPFC. This loophole is particularly worrying because most fish caught in the Convention Area are transhipped.⁴⁰⁰ The Review Panel believes that the Commission should adopt an appropriate CMM as a matter of priority. Such a scheme should take into account the FAO Voluntary Guidelines on Transshipments and the best practices already in place in other RFMOs. This should include alignment with the minimum standards offered by the FAO Guidelines, and appropriate coverage of all NPFC species caught in the Convention Area, regardless of where the transshipment occurs. The Review Panel welcomes the submission of a proposal to amend 2016-03 for consideration at the 6th TCC meeting (NPFC-2022-TCC06-WP23) as a positive development in this regard.

5.2.1.3. Review Panel's recommendations

Recommendation 5.2.1. That, as a priority, the Commission adopt a new comprehensive conservation and management measure to regulate and monitor transshipments.

5.2.2. Observer Program

295. Observers are a central element of RFMOs' management frameworks providing an effective means to monitor the exploitation of marine fishery resources. At-sea fisheries observers have traditionally been regarded as functional to fisheries management by collecting scientific data. Monitoring compliance with CMMs has often been left to at-sea inspectors. However, over time, observers have also come to play a role in monitoring compliance with fisheries regulations. Article 18(3)(f) UNFSA acknowledges observers' part in advancing compliance with fisheries regimes. It provides that flag States must adopt measures to ensure that vessels under their flag comply with regional standards, including "requirements for verifying the catch of target and non-target species through such means as observer programs, inspection schemes, unloading reports, supervision of transshipment and monitoring of landed catches and market statistics".
296. Today there is little doubt that observers play a crucial part in supporting fisheries management regimes. In practice, they not only serve a scientific function, but are part of MCS measures as a mechanism to monitor and potentially strengthen compliance with agreed rules. Their relevance can be seen in international (regional) observer programs and those operating at the national level. Observers all collect similar information designed to support the management of target fish stocks within agreed harvest levels and to minimise or mitigate the impacts of fishing upon non-target species.

5.2.2.1. The Review Panel's assessment of Observer Program

297. Article 7(2)(b) of the Convention tasks the Commission to adopt measures to ensure effective MCS, as well as compliance with and enforcement of the provisions of this Convention and management measures, including the development and implementation of a North Pacific Ocean Fisheries Observer Program "taking into account relevant international standards and guidelines".

⁴⁰⁰ Some interventions point to 85%. See TCC04 Final Report, par. 10.

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Under Article 13(4), each Member shall place observers on board fishing vessels entitled to fly its flag operating in the Convention Area “in accordance with the Observer Program” which shall be established in accordance with Article 7, subparagraph 2(b). The same provision states that fishing vessels engaged in bottom fishing in the Convention Area “shall have one hundred (100) percent coverage under the Observer Program”, but vessels involved in other types of fishing activities in the Convention Area “shall have a level of observer coverage as the Commission may decide”.

298. The extensive and detailed CMM 2016-05 for Bottom Fisheries and Protection of VMEs in the Northwestern Pacific Ocean and CMM 2016-06 for Bottom Fisheries and Protection of VMEs in the Northeastern Pacific Ocean, including its Annexes 1, 2, 4 and 5, implement the duty the Convention envisaged in Article 7(2)(b). These Measures contemplate wide-ranging requirements for the placement of observers and the information they must collect. They have served the Commission well for the purpose of gathering relevant scientific data. However, they only apply to bottom fisheries, which are relatively small (5-6 vessels) compared to other fisheries regulated by NPFC. These Measures also exhibit some aspects that deserve further consideration. For example, they rely on national programs but fall short of establishing a regional program in the Convention Area and lack a formal process for accreditation that would ensure common standards for national observer programs contributing to NPFC fisheries monitoring and regulation. NPFC has long been aware of these and other limitations regarding the work of observers. The SC recognized in 2017 the need “of developing a standardized protocol and data collection templates, as well as training and outreach programs, for ensuring the same standard of data collection by all observers”.⁴⁰¹ CMM 2016-05 and CMM 2016-06 have been revised (in 2017, 2018, 2019, 2016-05 only in 2021) but they maintain their original scope and rationale.

5.2.2.2. Review Panel’s findings

299. There is no fully developed regional observer program in NPFC. The SC has reviewed the existing NPFC observer programs and those of other RFMOs to prompt a discussion on the matter,⁴⁰² but Members have been unable to develop a full proposal for debate. Given the central role that observers perform in gathering scientific data and supporting the implementation and compliance with RFMOs’ management measures, the Review Panel urges the Commission to establish a comprehensive NPFC Observer Program for all NPFC fisheries. Failure to do so puts the NPFC out of step with comparable RFMOs and with international best practice.
300. There are several issues the Commission should consider in its future deliberations. This includes whether the Regional Observer Program should rely on national programs accredited under the Commission’s standards. Under this option, it is pivotal to establish the process for obtaining, maintaining and revoking accreditation. There are also issues concerning the participants in those programs: training, capacity building, if applicable, how to protect the data collected by observers and the requirements to ensure that observers are independent and impartial. Appropriate observer coverage is also essential, as is a clear recognition of the rights and duties of observers and crew on board. Finally, the Review Panel also notes that several other RFMOs have been working to address the issue of observer safety and encourages the Commission to consider adding this element to future discussions.

⁴⁰¹ SC02 Final Report, para 48 and COM03 Final Report, Annex E, para 48.

⁴⁰² NPFC-2018-SC03-WP03 (Rev.1).

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301. As mentioned above, the Observer Program need not be limited to scientific data collection only. NPFC CMMs provide that observers can and should support the monitoring of compliance with existing management measures, at least implicitly. For example, CMM 2021-09 on High Seas Boarding and Inspections procedures states in paragraph 10(d) that “[w]hile not limiting efforts to ensure compliance by all vessels, priority for boarding and inspection efforts pursuant to these procedures may be given to” fishing vessels “without observers on board if so required by the Convention, Article 7.2 (b)”. Equally, paragraph 8 of CMM 2019-13 for the CMS also recognizes the role of observers’ reports in supporting the preparation of the Draft Compliance Report. The TCC noted that other RFMOs’ observer programs are primarily set up for science. However, it still recommended to the Commission that “there is a need and desire among Members to continue to consider the compliance components of an observer program”.⁴⁰³

5.2.2.3. Review Panel’s recommendations

Recommendation 5.2.2. That the Commission adopts, as a matter of priority, a Regional Observer Program that includes all fisheries and is based on a common understanding of the role and function of observers and common templates for the collection of scientific fisheries data and monitoring compliance with CMMs.

5.2.3. Boarding and inspections procedures

302. Inspections at sea are one of the most effective methods to detect infringements and ensure compliance with RFMO measures. They allow an in-situ mechanism for qualified, professional officers of a Member State to witness the operations of a fishing vessel flagged to another Member or CNCP and identify actions or omissions that may amount to non-compliance incidents.
303. Boarding and inspection procedures were one of the central issues discussed at the Conference that negotiated UNFSA in 1995. Articles 21 and 22 UNFSA were a ground-breaking development in international fisheries law, establishing a detailed regime for at-sea inspections and prompting several RFMOs to develop their regional schemes. However, regional implementation of these provisions has never been easy. The costs and logistics associated with boarding and inspection procedures make it difficult for most States to broadly implement this MCS measure. Equally, some States remain reluctant to accept boarding and inspections as they do not accept armed inspectors boarding their fishing vessels. It is not surprising that only a handful of RFMOs has been able to develop a fully-fledged and active system of at-sea boarding and inspections. Considering its relatively short existence, it is remarkable that NPFC is one of them.

5.2.3.1. Review Panel’s assessment of boarding and inspection procedures

304. Article 7(2)(c) of the Convention tasks the Commission to adopt “procedures for the boarding and inspection of fishing vessels in the Convention Area”. Article 17(6) states that “boarding and inspection of fishing vessels in the Convention Area, as well as any subsequent enforcement action, shall be conducted in accordance with the procedures set out in Articles 21 and 22 UNFSA, and any such additional practical procedures decided by the Commission”.
305. The Commission adopted its Scheme in 2017 through CMM 2017-09 on High Seas Boarding and Inspection Procedures, which entered into force on 28 November that year. In 2018, the Commission further implemented its Scheme by adopting an impressive set of supporting

⁴⁰³ TCC03 Final Report, para 19.

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instruments through its Implementation Plan, including a template for boarding reports and a standard questionnaire. In 2021, after safety concerns were raised, the Commission added broader ladder requirements, now embedded in CMM 2021-09 (Annex A).

5.2.3.2. Review Panel's findings

306. NPFC is to be commended for adopting a comprehensive High Seas Boarding and Inspection Scheme and an impressive set of instruments to operationalise it. This is particularly remarkable considering that NPFC is the youngest RFMO and that it is often the case that the regulation of boarding and inspection at sea is a sensitive issue among RFMO Members. NPFC, and specifically some of its Members, must also be commended for the high number of procedures they undertake regularly. The Review Panel observes that part of the success of the Scheme follows from the careful tailoring of the current Measure to the needs and challenges the Commission identified and agreed upon.
307. However, further work would benefit some aspects of the boarding and inspection Scheme practice. An apparent issue is that some vessels in the recent past have not allowed boarding and inspection. The Commission would need to consider issuing clarifications to avoid boarding and inspection denials for COVID-related reasons.
308. A second concern is that debriefings show, at least *prima facie*, serious violations of existing CMMs. Under Article 17(4) of the Convention, in the event of a serious violation, the flag State must order the fishing vessel to cease operations and, in appropriate cases, call on the fishing vessel to leave the Convention Area immediately. The remedial actions in this provision are challenging to reconcile with a formal TCC or Commission decision on whether the incident amounts to a serious violation. The Commission should consider how to give Article 17(4) a practical application that still serves the purpose of deterring such infringements from occurring, including by, for example, tasking the TCC with outlining the appropriate circumstances in which fishing is to cease and a vessel ordered to return to port.
309. The third issue of concern, identified by the Review Panel, relates to the flow of information from high seas boarding and inspection reports and the work of the TCC and the Commission. The reports suggest that it is not always the case that the possible infringements observed by at-sea inspectors are further discussed at the TCC and the Commission, even though some violations may justify the inclusion of a vessel in the Draft IUU Vessel List. Section 5.2.7 considers follow-up on infringements further.

5.2.3.3. Review Panel's recommendations

Recommendation 5.2.3. That the Commission adopt procedures to implement Article 17(4) of the Convention and clarify the circumstances in which fishing is to cease and vessels ordered to port for 'serious violations'.

Recommendation 5.2.4. That information from high seas boarding and inspections be used, subject to data management rules, to inform assessments under the Compliance Monitoring Scheme and the preparation of the Draft IUU Vessel List.

5.2.4. IUU vessel listing and the issue of vessels without nationality

310. The blacklisting of vessels and the consequential application of punitive measures is one of the most common RFMO practices against IUU fishing. Regional approaches evolved under the call of the 2001 FAO International Plan of Action to Prevent, Deter and Eliminate IUU Fishing (IPOA-

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IUU), perhaps the most influential non-binding instrument contributing to the global fight against IUU fishing activities. The IPOA-IUU provides that States, acting through RFMOs, “should take action to strengthen and develop innovative ways, in conformity with international law, to prevent, deter, and eliminate IUU fishing” (paragraph 80). The IPOA-IUU encourages States and RFMOs to develop and maintain records of vessels engaged in or supporting IUU fishing in the area of competence of the relevant RFMO (paragraph 80.5). It also tasks States and RFMOs to define circumstances in which vessels will be presumed to have engaged in, or to have supported, IUU fishing (paragraph 80.11).

311. After the adoption of the IPOA-IUU in the early 2000s several RFMOs, such as ICCAT and IOTC, began adopting their IUU listing schemes. Over time, most RFMOs followed the practice of blacklisting vessels engaged in IUU fishing, whether they were flagged to Members or non-Member States. They have all applied similar punitive measures, from denying registration and fishing authorisations to blocking access to their ports and markets. RFMOs have adopted similar substantive and procedural regulations for approving their IUU Lists, and NPFC is no exception. Article 1(k) of the Convention expressly refers to IUU fishing as described in the FAO IPOA-IUU.
312. According to the FAO IPOA-IUU, fishing activities conducted by vessels without nationality, or stateless vessels, are unregulated IUU fishing. States should take measures consistent with international law in relation to vessels without nationality on the high seas involved in IUU fishing (paragraph 20). NPFC has particular issues with stateless vessels as evidenced by the number of such vessels on the NPFC IUU Vessel List. This is discussed further below.

5.2.4.1. Review Panel’s assessment of IUU vessel listing and stateless vessels

313. Agreement on a conservation measure which provides a framework for adopting an IUU Vessel List was among the first accomplishments of NPFC. It was adopted in 2016 at the 1st TCC meeting and the 2nd meeting of the Commission (CMM 2016-02). The same year the TCC recommended, and the Commission adopted, the CMM to address the problem of vessels without nationality (CMM 2016-04). The IUU Vessel List CMM was amended in 2017 to encourage the exchange of information regarding vessels presumably engaged in IUU fishing. The same year NPFC adopted its first IUU Vessel List. The current text of this CMM was adopted in 2019 (CMM 2019-02).
314. The IUU CMM follows a similar structure as those in other RFMOs.⁴⁰⁴ The activities that justify inclusion on the IUU List contain several types of infractions, including engaging in “any other fishing activities that undermine the provisions of the Convention or any other NPFC conservation measure” (paragraph 3i). The procedure is structured in three stages: preliminary identification by all means available and inclusion on the Draft List by the Executive Secretary (including information gathered by the Secretariat under paragraph 8), discussion at the TCC and adoption of the Provisional List and assessment by the Commission and adoption of the Final List.
315. Paragraph 24 of CMM 2019-02 sets out a comprehensive list of actions Members must take against vessels included on the IUU List. CMM 2019-02 also contemplates rules for the delisting of IUU vessels. It has some original provisions that may perform a valuable role in deterring illegal fishing beyond the Convention Area. For example, according to paragraph 4 the coastal State may propose a vessel for inclusion on the IUU vessel list if bilateral discussions with the flag State do not solve

⁴⁰⁴In the Pacific context, see for example WCPFC and SPRFMO.

the matter. However, the measure lacks one innovative mechanism used in several RFMOs: the cross-listing of vessels included in other RFMOs' IUU Vessel Lists.

316. CMM 2016-04 concerns stateless vessels. It has not been amended since its adoption. Considering that the IPOA-IUU regards vessels without nationality as a type of unregulated fishing, CMM 2016-04 simply provides encouragement for Members to take enforcement actions against these vessels (paragraph 3). This CMM also calls on Members to amend their domestic legislation to prevent and deter vessels without nationality from engaging in fishing activities in the Convention Area (paragraph 4). Paragraph 5 encourages Members and CNCs to share information on the matter, to clarify the status of such vessels, and enable Members to make informed decisions about action to prevent and deter such vessels from engaging in fishing activities in the Convention Area.

5.2.4.2. Review Panel's findings

317. The NPFC adopted, at an early stage after its establishment, a CMM establishing a process to establish the NPFC IUU Vessel List. Since 2017, the Commission has worked successfully to deliver an IUU Vessel List at every annual meeting. However, the Review Panel highlights two aspects. First, examining the IUU listing processes undertaken by NPFC since 2017 and their outcomes cast a clear picture. In the four assessments the Commission has undertaken under the IUU listing process (2017, 2018, 2019 and 2021), all the vessels included on the Final IUU Vessel List appear to be without nationality. Therefore, it fair to conclude that stateless vessels are one of the main IUU problems NPFC faces.
318. In this context, the lack of information about the operations of the stateless vessels included in the annual IUU Vessel List is a concerning finding. The discussions among Members recorded in the Annual Reports suggest that Members do not have much hard evidence about the provenance of these vessels, although some interventions point out that they – or some of them – may operate from the ports of NPFC Members. Several vessels on the IUU Vessel List also appear to be duplicates. The Commission should consider ways to find out more about these vessels, their activities and the ports they frequent by using all the MCS tools available, including AIS data. Significantly, there is no information about beneficial ownership of any of the listed vessels. As the experience in other RFMOs shows, a central point in dealing with stateless vessels (and similarly, with non-cooperative flags of convenience) is obtaining details of beneficial owners and other operational agents behind these operations and the ports where they seek shelter and trade. If NPFC is genuinely determined to address this worrying issue effectively, it must deploy political will and all the means available, to develop intelligence and encourage individual actions by all Commission Members. The Review Panel invites the Commission to consider all possible measures and tools to cooperate to address the acute problem of stateless vessels found operating in the Convention Area, as such IUU activities continuously undermine the effectiveness of CMMs and the efforts to achieve the objective of the Convention.
319. A second aspect to note is the relationship between high seas boarding and inspection events and how the outcomes of such inspections can feed into the discussion of the IUU listing process and compliance mechanisms in general. Once the CMS is fully implemented, it is expected that relevant information arising from at-sea inspections will contribute to identifying infringements and treating them accordingly. However, the mechanisms are already in place when it comes to the IUU Vessel List. Yet it appears that possible violations by vessels flagged to Commission Members, as described by inspectors, do not lead to the inclusion of such vessels on the Draft IUU

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Vessel List. The examination of high seas boarding and inspection reports suggests infringements of existing CMMs could have justified the inclusion of the vessel on the Draft IUU Vessel List.

320. The Secretariat's role is a central issue in drafting the IUU lists and for the process efficiency. The Review Panel notes that paragraphs 2 and 8 of CMM 2019-02 are ambiguous as to whether the Secretariat may include a vessel on the Draft List, even if Members do not request such inclusion. The Review Panel considers that the IUU listing process would benefit from the Secretariat performing a supporting role by identifying possible vessels for the Draft List that the TCC and the Commission would later discuss.

5.2.4.3. Review Panel's recommendations

Recommendation 5.2.5: That the Commission adopts a long-term strategy to address the problem of vessels without nationality engaged in IUU fishing, with specific steps for finding and collecting information about each vessel, including on beneficiaries of their fishing activities and their operational aspects.

Recommendation 5.2.6: That the Commission make full use of the information arising from at-sea inspections, including the possibility of vessels being included on the Draft IUU Vessel List.

Recommendation 5.2.7: That the Commission develop processes for the reciprocal recognition of the IUU Vessel Lists of other RFMOs.

5.2.5. Vessel Monitoring System

321. A VMS system is one of the quintessential MSC measures in any RFMO. Under the IPOA-IUU, States should undertake comprehensive and effective MCS of fishing by implementing a VMS, "in accordance with the relevant national, regional or international standards, including the requirement for vessels under their jurisdiction to carry VMS on board". As a critical element of flag State responsibility, Article 13(4) of the Convention provides that each Contracting Party shall require fishing vessels that are entitled to fly its flag and that are engaged in fishing activities in the Convention Area: (a) to use real-time satellite position-fixing transmitters while in the Convention Area following procedures developed under Article 7, subparagraph 2(e); and (b) to notify the Commission of their intention to enter and exit the Convention Area under procedures developed according to Article 7, subparagraph 2(f).
322. The first discussions to establish a VMS system for NPFC started in 2017 at the TCC. An intersessional SWG was established. After working in 2017, 2018 and 2019, the Commission developed and adopted a CMM on VMS.⁴⁰⁵ However, the Measure needed further refinement, and the TCC and the Commission have worked on it from 2019 to date.

5.2.5.1. Review Panel's findings

323. In designing the VMS as an MCS tool for NPFC, the Commission sought to minimize costs to Members and their fishing industries while making Members responsible for the conduct of their nationals and fleets. The system, therefore, allows Members to use existing VMS systems as long as they can provide the data required in the necessary format and time through the VMS provider to the regional system. This approach is common among RFMOs. For these purposes, CLS, the

⁴⁰⁵ COM05 Final Report, Annex N.

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VMS provider appointed by the Commission, was required to adapt its capability to accept inputs from each of the Member's VMS system to display on the Regional NPFC-VMS.

324. Negotiations for a CMM establishing and regulating the VMS among Commission Members resulted in a hybrid system combining a new VMS housed at the Secretariat that draws on Members' existing systems. Accordingly, the Commission adopted the Guidelines on minimum standards for mobile transmitting units or MTUs.⁴⁰⁶ However, in case of faulty MTUs, Members could mandate their vessels to report manually to the Member's Fisheries Monitoring Center (FMC) or the Secretariat (paragraph 16), and Members may require the vessels to report directly to the regional system (paragraph 17). However, direct reporting by vessels to the regional system would mean by-passing the FMCs, which does not seem to be the intention of the CMM. Such direct reporting may also incur additional communication costs for the Secretariat.
325. There are other operational aspects that the Commission should further elaborate. For example, the current CMM does not elaborate on measures to prevent tampering with units. Equally, there are no rules to access VMS data to support high seas boarding and inspections, a central element for planning these operations.

5.2.5.2. Review Panel's recommendations

Recommendation 5.2.8: That the Commission consider adopting arrangements to prevent tampering with mobile transmitting units for accessing VMS data held by the Secretariat and to make VMS data available to support decisions of Members regarding the planning and conduct of high seas boarding and inspection.

5.2.6. Market-related measures

326. Market-related measures, sometimes described more generically as trade-related measures, are important tools States and RFMOs have at their disposal to prevent and deter IUU fishing. Depending on the definitions applied, they vary in shape and scope. They include eco-labels and soft- or hard-law documentation schemes and the more radical prohibitions of imports of fishery products originating from vessels or flag States that fail in their obligations to control IUU fishing by their vessels or nationals.
327. Some market-related measures are widely accepted but only adopted in a handful of RFMOs and similar organizations, such as catch documentation schemes. Other trade measures have slowly become recognized over time, such as prohibiting market access in cases of serious IUU fishing. Admittedly, they entail considerable costs of implementation, which can be a barrier to developing these tools, irrespective of how effective they are under certain circumstances.

5.2.6.1. Review Panel's findings

328. Article 7(2)(g) of the Convention states that the Commission shall "establish, where appropriate, non-discriminatory market-related measures consistent with international law to prevent, deter and eliminate IUU fishing". To date, the Commission has not adopted any market-related measures, nor have there been any proposals for market-based measures. Responses to the questionnaires suggest they are not a priority for Members at this stage. Likewise, meeting reports do not identify any Members wishing to prioritise the development of market-related measures in the NPFC context.

⁴⁰⁶ Annex to CMM 2021-12.

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329. It is therefore fair to conclude that adopting trade-related measures is either not necessary yet or that these measures are not as urgent as other MCS measures. The records of discussion in the TCC and Commission reports suggest that other MCS measures have more urgency for the Commission. That said, the fact that Members have not tabled, discussed and adopted market-related measures does not mean they are irrelevant. The domestic performance of some NPFC Members points to the relative importance they attach to these measures, which they apply as a requirement for access to their markets. Yet these individual preferences do not seem to have reached a broader consensus for adoption more generally in NPFC.

5.2.6.2. Review Panel's recommendations

Recommendation 5.2.9: That the Commission focus on developing, improving and implementing other more urgent MCS tools and postpone the development of regional market-related measures at this time.

5.2.7. Follow-up on infringements

330. Follow-up on infringements is a central element of flag State responsibility. The practice of RFMOs is to establish mechanisms among Members that specify the consequences associated with infringements, thus facilitating the exchange of information regarding possible cases of non-compliance. These mechanisms, known as compliance monitoring systems or schemes (CMS), are often structured in three stages. In the first stage, the RFMO secretariat gathers relevant information from different sources, which Members and CNCPs receive and review. In the second step, Members and CNCPs investigate and respond to the issues presented. In the third stage, all the information available, including replies by relevant States to possible infringements, are subsequently reviewed and assessed at the annual RFMO meeting. The organization's compliance body often recommends remedial and other actions to the Commission. The range of obligations considered in such processes varies, but the practice of RFMOs suggests that they tend to expand the scope of the compliance mechanisms as their schemes mature.
331. More generally, compliance monitoring systems are designed to support States' actions to implement their international obligations under fisheries conventions. They are critical to integrating different sources of information on possible infringements, providing a broad picture of how Members implement their commitments, defining priority areas and identifying elements of CMMs that might benefit from review. Compliance schemes allow Members to access and share information about non-compliance situations and progressively generate common criteria and standards for addressing them.
332. Compliance mechanisms consistent with Article 10(h) of the UNFSA provide that States must "establish appropriate cooperative mechanisms for effective monitoring, control, surveillance and enforcement". Where there are alleged violations of conventional obligations or existing management measures, Article 20(3) UNFSA provides that the flag State may undertake investigations directly, or in cooperation with other States or RFMOs. Information on the progress and outcome of the investigations "shall be provided to all States having an interest in, or affected by, the alleged violation".

5.2.7.1. Review Panel's assessment of follow-up on infringements

333. Article 17 of the Convention also relates to this critical aspect of compliance and enforcement. Paragraphs (2), (3) and (4) provide that each Member of the Commission "shall, either on its own initiative or at the request of any other Member of the Commission and when provided with the

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relevant information, investigate fully any allegation that fishing vessels entitled to fly its flag have violated any of the provisions of this Convention or any CMM adopted by the Commission”.

334. When there is sufficient information available in respect of an alleged violation by a fishing vessel entitled to fly its flag, the Member concerned “shall take appropriate actions in accordance with its laws and regulations, including instituting proceedings without delay and, where appropriate”, including ordering the vessel to cease operations, to leave the Convention Area immediately and even detain the ship concerned. Critically, the Member must “ensure that the vessel concerned does not engage in fishing activities in the Convention Area for fisheries resources until such time as all outstanding sanctions imposed by that Member in respect of the violation have been complied with.”
335. Article 17 paragraphs (8) and (9) further state that all investigations and judicial proceedings to be undertaken by the Member concerned are to be carried out expeditiously. Sanctions imposed “shall be adequate in severity to be effective in securing compliance and to discourage violations wherever they occur and shall deprive offenders of the benefits accruing from their illegal activities”. Reporting on the progress of any investigation “must be provided to the Member of the Commission making the request and to the Commission as soon as practicable and in any case within two months of the request.” A report on the outcome of the investigation shall be provided to the Commission Member making the request and to the Commission when the investigation is completed.
336. Establishing a CMS has been on NPFC’s list of tasks, including under its Work Plan, since at least 2018. The first CMS measure was adopted in 2019, with the overarching goal of implementing Articles 7, 13 and 17 of the Convention. CMM 2019-13 has many elements that are common to similar schemes adopted by other RFMOs. It is designed to identify cases of non-compliance by Members and CNCPs and to inform the Commission of areas where technical assistance and capacity building may be needed. It also aims at identifying aspects of CMMs that may require amendment for effective implementation. It has the common objective of determining responses to non-compliance and monitoring corrective actions to resolve outstanding instances of non-compliance (paragraph 2).
337. The NPFC-CMS follows the three-stage structure identified above. One positive aspect is outlined in paragraph 15 of the Measure. It provides that each compliance assessment shall be decided by consensus, but when consensus cannot be reached, the Provisional Compliance Report must indicate majority and minority views. A Member or CNCP may not block an agreement on its compliance assessment. However, the same logic is not followed for the adoption of the Final Compliance Report.
338. One negative aspect of the first CMS adopted in 2019 was its limited scope. Annex II, on the obligations to be assessed, only included CMM 2019-05 (Bottom Fisheries) and 2019-08 (Pacific Saury). However, paragraph 22 of CMM 2019-13 provides that Annex II will be reviewed annually and may be amended considering factors such as the priorities of the Commission or the risks associated with non-compliance to the long-term objectives of the Convention. At the 2021 meeting, the TCC recommended that a comprehensive list of obligations under a wider array of existing CMMs be assessed as part of the CMS process. While Annex II of CMM 2019-13 was not formally amended; Annex L of the 2021 6th Commission Meeting Report established a “List of Reporting Obligations for 2022”. There is also a sunset clause in paragraph CMM 2019-13, which states that the CMM “shall expire three years after its entry into force”.

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339. An issue that requires further action is the Compliance Status Table in Annex I. Although it is clear and offers sensible alternatives to Members when adopting decisions, it lacks a distinction within categories of non-compliance. RFMO practice establishes criteria and mechanisms to address instances of persistent, repeated or severe non-compliance and applies measures accordingly, such as demanding specific action plans from States involved and agreeing on special penalties. Such distinctions facilitate difficult discussions and boosts compliance and enforcement in the long term.

5.2.7.2. Review Panel's findings

340. The Review Panel commends the adoption of the CMS in CMM 2019-13. It acknowledges that the Measure contains the structure and process to serve the goals for which these mechanisms are established. The Scheme is, in principle, fit for purpose and should become one of the pillars upon which the Commission ensures compliance and enforcement with NPFC obligations. Equally, the Review Panel acknowledges the first CMS assessment was tabled at the 5th meeting of the TCC in 2021, where no infringements were found.⁴⁰⁷
341. However, the Review Panel also notes that in light of the limited scope of Annex II of CMM 2019-13 and the list of obligations or “audit points” to be assessed as agreed by the Commission in 2021, it is inevitable that the Scheme has not been thoroughly tested. It remains to be seen how the TCC and the Commission will handle a longer and more complex list of obligations –like those in most other RFMOs – and how it will deal with actual instances of non-compliance.
342. On a related issue, the Review Panel wishes to note that one of the risks to the CMS and similar mechanisms is that they can quickly become almost entirely based on self-assessments provided by Members and CNCs. To date the Secretariat has relied wholly on self-assessment by Members and CNCs to assess compliance with existing CMMs. The Commission may wish to consider all the tools at its disposal to ensure that data is collected through MCS measures so that the CMS is robust and meaningful and Members’ assessments are based on independently verifiable information.
343. In this context, the Commission may benefit from developing a template for the Secretariat to undertake the task of collecting the relevant data for the implementation report of the CMMs included in the CMS. Also, transiting from manual to automated reporting would facilitate the Secretariat’s work and performance and benefit the TCC and the Commission.
344. A similar benefit would follow from reconsidering the CMS final decisions as provided in the Compliance Status Table discussed above. Stating that the Commission will have “consideration of further responses” to address cases of non-compliance is too general. The identification of distinctions according to the severity of non-compliance incidents would facilitate discussions and any responding remedial actions.
345. That said, the Review Panel expects that once it becomes entirely operational and includes a substantive list of obligations to assess, the CMS should serve the overarching purpose for which it was established. It should also become a helpful tool for collating different sources of data regarding possible infringements. In fact, without the CMS, it is often the case that the Annual Reports offer little information about investigations into alleged violations or actual sanctions. This does not necessarily mean that Members have not addressed some instances of IUU fishing

⁴⁰⁷NPFC-2021-TCC05-WP09 (Rev.3).

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or other infringements. However, it is not always clear from the TCC and Commission reports whether a breach has occurred and as a result, whether there were investigations into alleged violations.

346. In this context, the Commission may wish to apply all MCS tools and technologies at NPFC's disposal in order to better integrate compliance information. One example, highlighted in Section 5.2.3 concerns high seas boarding and inspection procedures and the outcome of such inspections. Since 2019, several reports from at-sea inspections record instances of possible non-compliance. They may offer information that flag States should thoroughly investigate and report to the TCC and the Commission. However, they have not made it into the CMS. Such alleged infringements include those concerning the marking of vessels, failure to show a licence on board, and failure to record catches. Equally, the Commission should consider data flowing from other technologies that NPFC currently does not utilize, but that could shed light on suspicious activities or possible infringements, such as AIS.
347. Finally, as mentioned in other parts of this Report, the Review Panel wishes to note that the Commission would benefit from reducing manual reporting and transit to e-reporting where possible. Such a development would significantly facilitate and streamline the CMS process and other compliance tasks.
348. NPFC is at a transition point in the implementation of the CMS. The agreement adopted in 2021 concerning the obligations to be covered by the CMS should be incorporated into Annex II of CMM 2019-13 and become a permanent feature. Equally, the Commission should consider amending the sunset clause so the current CMM does not expire in 2022 and instead focus on improving the CMS as it learns from experience over time.

5.2.7.3. Review Panel's recommendations

Recommendation 5.2.10: That the Commission continue to implement and improve its CMS, including by integrating, in the best possible way, all the MCS instruments at its disposal in order to supplement self-reporting by Members and CNCPs with verifiable data and information.

Recommendation 5.2.11: That the Commission migrate from manual to automated reporting to gather compliance and enforcement data, in order to facilitate the CMS process.

Recommendation 5.2.12: That the Commission establish criteria and mechanisms to address instances of persistent, repeated or serious non-compliance and apply measures accordingly, such as demanding specific action plans from States involved and a specified schedule of appropriate penalties or sanctions.

5.3. Flag State Duties and the requirements for Vessel Registration

349. Article 13 specifies flag State duties under the Convention. Under paragraph (1), Members must ensure that the fishing vessels entitled to fly their flag comply with the provisions of the Convention and measures adopted according to it and do not conduct unauthorized fishing activities within areas under the national jurisdiction of another State adjacent to the Convention Area. Under Article 13(2), Members shall not allow any fishing vessel entitled to fly its flag to be used for fishing activities in the Convention Area unless authorised by the appropriate authority.
350. Equally, Article 13 paragraphs (4), (6) and (7) set out other flag State duties regarding reporting the position of transshipments, the placement of observers and accepting boarding and inspection.

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Members must require fishing vessels that are entitled to fly their flag and that engage in fishing activities in the Convention Area to use real-time satellite position-fixing transmitters while in the Convention Area and to notify the Commission of their intention to enter and exit the Convention Area, in accordance with procedures developed under Article 7, subparagraph 2(e) and (f). Members must also notify the Commission of the location of any transshipment of fisheries resources and products of fisheries resources taken in the Convention Area, pending the adoption by the Commission of procedures for the regulation and monitoring of transshipments under Article 7, subparagraph 2(a).

351. As part of flag State duties, Members must place observers on board fishing vessels entitled to fly their flag operating in the Convention Area in accordance with the Observer Program. Such a Program shall be established under Article 7, subparagraph 2(b), except that fishing vessels engaged in bottom fishing in the Convention Area shall have 100% coverage. Members shall ensure that fishing vessels under their flag accept boarding by duly authorized inspectors in accordance with procedures for the boarding and inspection of fishing vessels in the Convention Area adopted by the Commission under Article 7, subparagraph 2(c).
352. Finally, Article 13 paragraphs (8) and (9) establish the obligations concerning the Commission's Vessel Registry. Each Member must maintain a record of fishing vessels entitled to fly its flag and authorized to be used for fishing activities in the Convention Area following the information requirements, rules, standards, and procedures adopted by the Commission. Members must provide annually to the Commission information, as decided by the Commission, concerning each fishing vessel entered in the record and promptly notify the Commission of any modifications to this information. Each Member must promptly inform the Commission of any additions and deletions from the record, including reasons for such changes. Equally, the Commission must maintain its record of fishing vessels based on the information provided by Members under paragraphs (8) and (9). The Commission shall make this record publicly available, taking into account the need to protect the confidentiality of personal information, consistent with the domestic practice of each Contracting Party.

5.3.1. Review Panel's assessment of flag State duties

353. There are multiple connections between the Convention's mandate to adopt MCS measures in Article 7(2) and the extent to which Members must implement flag and port State duties in Articles 13, 14 and 17. The difficulties associated with the lack of specific CMMs have already been discussed in previous sections and will not be repeated here. Some of them directly relate to flag State responsibilities, such as the regulation and monitoring of transshipments, the placement of observers and the scope of the CMS scheme. Because these Measures have not been adopted or have not been fully implemented, it is not possible to assess how flag States fulfil their duties regarding these obligations. Other relevant CMMs for flag State performance, such as the IUU listing process, have their problems, which this chapter also discussed and assessed. In this context, this section will examine how the record of vessels, one of the primary measures in promoting flag State responsibility as recognized in Article 16, has been implemented.
354. The requirements for vessel registration were among the first issues to be addressed by the Commission. CMM 2015-01 was adopted at the 1st Commission meeting ("Information Requirements for Vessel Registration"). The Vessel Registry was amended again in 2016, 2018,

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2019 and 2021, streamlining its requirements and including, among other conditions, the FAO standards for marking and identifying fishing vessels.⁴⁰⁸

355. However, until 2019, NPFC also allowed for an interim mechanism to enable Members and CNCPs to submit a list of carrier vessels flagged to non-Members that were permitted to conduct transshipments with fishing vessels of Members or CNCPs. Such an interim regime was an exception to the practice of most RFMOs, and it represented a risk as the carrier flag State was not a party or cooperating State with NPFC. This exception was not renewed in 2021.

5.3.2. Review Panel's findings

356. After years of discussions and revisions, except for a few issues outlined below, CMM 2021-01 "Information Requirements for Vessel Registration" appears to be fit for purpose. Although some operations of vessels not included in the Registry have occurred, these incidents are generally triggered by poor oversight from flag States. At the same time, Members in general duly investigate these incidents according to their domestic legislation, even though the information on the follow-up actions is not always provided promptly and only occurs if the vessel is included in the Draft IUU Vessel List.
357. The Review Panel believes that the Commission would benefit from clarifying and considering some improvements to the requirements for vessel registration. First, on the conditions themselves: not all conditions appear equally relevant, and some may be redundant. Second, the vessel register information is entered by the Member and later confirmed by the Secretariat. However, the Member can edit the data, and there is no requirement to advise the Secretariat. This loophole may create confusion and duplicate information. Third, the Commission should clarify the registration requirements for the vessels undertaking bunkering activities in the Convention Area. As bunkering supports fishing activities, it falls into the definition of "fishing" under Article 1(h) of the Convention ("any operation at sea in direct support of, or in preparation for, any activity" regarded as fishing). Therefore, there is no reason to exclude bunkering from the general obligations applicable to vessel registration. Finally, the Commission should, as a matter of priority, confirm the duty to have an IMO number for vessel registration by deleting the words "pending" in CMM 2021-01, Annex I, field "i".

5.3.3. Review Panel's recommendations

Recommendation 5.3.1: That the Commission review the requirements for vessel registration to avoid demanding unnecessary information and to improve the registration process to prevent duplication and confusion.

Recommendation 5.3.2: That the Commission clarify that all vessels undertaking support activities in the Convention Area, including bunkering, should comply with vessel registration requirements.

Recommendation 5.3.3: That the Commission confirm the duty to have an IMO number for vessel registration by amending Annex I of CMM 2021-01.

⁴⁰⁸ FAO. 1989. Standard Specifications for the. Marking and Identification of Fishing Vessels. FAO, Rome. 69 pages.

5.4. Port State duties and minimum standards

358. Measures adopted and implemented by the port State are a central pillar to combat IUU fishing. In this context, port access means admission of foreign fishing vessels to ports or offshore terminals for, *inter alia*, refuelling, re-supplying, transshipping and landing (IPOA-IUU, paragraph 53). These are critical activities for operators seeking to improve the economic viability of their fishing operations. Therefore, by regulating access to their ports and inspecting vessels allowed to enter and use them, States can substantively reduce the risks of IUU catches crossing borders, thereby deterring illegal activities in the long term.
359. The importance of port States in the global architecture against IUU fishing led to the adoption of the FAO 2009 Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (the PSM Agreement). It establishes minimum standards based on a simple approach: States must demand, receive and assess information before deciding whether they grant access to their ports and then inspect those vessels that may have been involved in IUU fishing. States parties to the PSM Agreement and those that have not ratified it yet but regard the Agreement and port State measures more generally as crucial tools to fight IUU fishing have pushed for changes at the regional level. They have prompted RFMOs to follow a similar path by adopting standard rules for their Members to grant access to their ports, including minimum standards for inspections, sharing information and building capacity.
360. The practice of RFMOs confirms that port State measures are a critical MSC tool to prevent IUU fishing. In the Pacific Ocean, for example, IATTC (Resolution C-21-07, WCPFC (CMM 2017-02) and SPRFMO (CMM 7-2022) have all adopted minimum standards, seeking consistency with the PSM Agreement. In NPFC, Article 14 of the Convention recognizes the right and duty of coastal States to adopt measures to regulate the entrance and use of their ports. It implicitly provides that each Member must “give effect to port State measures adopted by the Commission in relation to the entry and use of its ports by fishing vessels that have engaged in fishing activities in the Convention Area”.

5.4.1. Review Panel’s findings

361. Despite the text of Article 14 of the Convention, the fact that all NPFC Contracting Parties except one are also parties to the FAO 2009 PSM Agreement, and the extensive practice of RFMOs worldwide, NPFC has yet to adopt a common scheme defining the minimum standards for PSM. Members and stakeholders have recognized this loophole in their questionnaire responses.
362. The reasons for NPFC not having a regional measure are only speculative. Perhaps Members feel that their national legislation is enough to adequately build a regional, common front on port State measures, particularly those that have ratified and implemented the PSM Agreement. Others may sense that their obligations under other RFMOs have already advanced the implementation of domestic port State controls. However, the lack of common standards prevents Members from having a valuable tool to combat IUU fishing. For example, a standard scheme would facilitate an understanding of the frequency of foreign vessels’ visits to ports, enable designated ports for compliance purposes, and facilitate the exchange of information on requests for access and inspections. It would also help address the issue of stateless vessels operating in the Convention Area as Members could share information and take appropriate actions to prevent such vessels from seeking shelter, supplies and markets through Member States’ ports.

363. The Review Panel agrees that it would be desirable to make improvements in this area in line with the approach taken in other comparable RFMOs. The Commission should consider adopting a PSM scheme which establishes minimum standards for port inspections. That CMM should promote consistency with the FAO 2009 PSM Agreement and notification and inspection regimes across the Convention Area. The future NPFC PSM scheme should also consider a robust mechanism for the exchange of information on possible IUU vessels seeking access to NPFC ports so that Members can adequately deny such vessels the benefits of IUU fishing.

5.4.2. Review Panel's recommendations

Recommendation 5.4.1: That the Commission adopt, as a matter of priority, a conservation and management measure specifying minimum standards for port inspections, consistent with the FAO 2009 Port State Measures Agreement.

5.5. Measures to deter nationals from engaging in IUU fishing

364. The pivotal role of the flag State in international fisheries does not mean there are no other jurisdictional links that States can assert on the high seas. Paragraph 18 of the IPOA-IUU provides that States should “take measures or cooperate to ensure that nationals subject to their jurisdiction do not support or engage in IUU fishing”. Admittedly, not every RFMO has adopted a common scheme to implement the States’ duty to prevent their nationals – both legal and natural persons – from engaging in IUU fishing. Yet some regional experiences, like the measures enacted by CCAMLR in the late 2000s, eventually proved a helpful tool to support other actions to fight IUU fishing by flags of convenience and vessels without nationality.
365. Article 17(7) of the Convention provides that, without prejudice to the priority of the responsibility of the flag State, “each member of the Commission, in accordance with its laws, shall: (a) to the greatest extent possible, take measures and cooperate to ensure compliance by its nationals, and fishing vessels owned, operated or controlled by its nationals, with the provisions of this Convention and any conservation and management measures adopted by the Commission”. The same provision states that “(b) either on its own initiative or at the request of any other member of the Commission and when provided with the relevant information, promptly investigate any alleged violation by its nationals, or fishing vessels owned, operated or controlled by its nationals, of the provisions of this Convention or any conservation and management measures adopted by the Commission”.

5.5.1. Review Panel's findings

366. No standard approach to implementing the obligations under Article 17(7) appears in sight for NPFC. Neither the TCC nor the Commission has discussed any proposal in this regard. The Commission has not taken steps to review the implementation of this provision either. However, Members should not disregard mechanisms to make these obligations operational. Considering the high number of IUU fishing sightings in the form of stateless vessels operating in the Convention Area, measures binding States to exert responsibility through the nationality link could play a role in deterring these activities. The Review Panel notes that the Convention tasks Member States to take measures and cooperate to ensure compliance by its nationals with the provisions of this Convention. Although it is not a matter of priority for the Commission, Members may wish to implement a scheme in the medium term to prevent their nationals from engaging in IUU fishing, including on board stateless vessels. Considering the extension and seriousness of the IUU

operations of stateless vessels, any measures or tools that could contribute to addressing the problem should be explored by the Commission, including actions taken by the State of the nationality to deter captains and crews from engaging in IUU activities.

5.5.2. Review Panel's recommendations

Recommendation 5.5.1: That the Commission consider the development of a specific scheme to implement the obligations under Article 17(7) so that Members and CNCPs take adequate measures to prevent their nationals from engaging in IUU fishing activities.

6. Decision-making and Dispute Settlement

6.1. Decision-making

367. Article 8 of the NPFC Convention provides:

1. As a general rule, the Commission shall make its decisions by consensus.
2. Except where this Convention expressly provides that a decision shall be taken by consensus, if the Chairperson considers that all efforts to reach consensus have been exhausted:
 - a. decisions of the Commission on questions of procedure shall be taken by a majority of Members of the Commission casting affirmative or negative votes; and
 - b. decisions on questions of substance shall be taken by a three-quarters majority of Members of the Commission casting affirmative or negative votes.
3. When the issue arises as to whether a question is one of substance or not, that question shall be treated as one of substance.
4. No decisions shall be taken unless there is a quorum of two-thirds of the Members of the Commission present at the time the decision is to be taken.

368. This decision-making process requires consensus decision-making for specific decisions as set out in the Convention, namely decision making on the terms and conditions for any new fisheries in the Convention Area and the nature and extent of participation in such fisheries,⁴⁰⁹ on the budget, and on the formula for contributions.⁴¹⁰ For all other decisions, if Members are unable to agree, there is the possibility to move to a vote. However, to date there have been no instances in the NPFC where a decision has been taken by vote.

369. Decisions become binding on Members 90 days after notification of its adoption, except where a Member objects under Article 9 of the Convention on the grounds that the decision is inconsistent with the provisions of the NPFC Convention, the 1982 UN Law of the Sea Convention or the 1995 UN Fish Stocks Agreement, or that the decision unjustifiably discriminates in form or in fact against the objecting Member. Where this occurs, the objecting Member must provide an explanation of the grounds for its objection and must also adopt and implement alternative measures that are equivalent in effect to the decision to which it has objected. Any other Member may request a meeting of the Commission to review the decision to which the objection has been presented, to which must be invited two or more experts who are nationals of non-members of the

⁴⁰⁹ Article 10 (1)(g).

⁴¹⁰ NPFC Convention, Article 12.

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Commission and who have sufficient knowledge of international law related to fisheries and of the operation of regional fisheries management organizations to provide advice to the Commission on the matter in question. The Commission considers whether the grounds for the objection are justified and whether the alternative measures adopted are equivalent in effect to the decision to which the objection has been presented. If the Commission decides, presumably using the decision-making procedure in the Convention, that the grounds are not justified and that the alternative measures are not equivalent, the objecting Members is faced with three alternatives: present different alternatives; implement the decision, or pursue dispute settlement under Article 19 of the NPFC Convention.

370. Article 9 of the Convention has not been used by the NPFC, but it provides an alternative procedure where the Commission seeks to take a decision by vote to which a Member objects. In this regard it is similar to the Conventions establishing the Western and Central Pacific Fisheries Commission (WCPFC) and the South Pacific Regional Fisheries Organization (SPRFMO). The main difference, however, is that instead of an independent Review Panel making findings and recommendations, the NPFC Convention provides for the Commission to receive advice from independent experts, and to decide the matter itself using the decision-making procedures in the Convention. Article 9 therefore cannot be characterised as a limited form of dispute resolution found in those other Conventions and which has been used by Members of SPRFMO. Rather, the NPFC procedures provide a means for the Members of the Commission to resolve objections to decisions of the Commission taken by majority vote.
371. Allowing the possibility of voting where all efforts to reach consensus have been exhausted can facilitate the adoption of conservation and management measures to overcome the objections of one Member. However, there is a clear practice within NPFC of consensus decision-making and NPFC Members appear to support making all efforts to reach consensus. This promotes harmony within the organization and a willingness to implement decisions of the Commission. On the other hand, the disadvantages of consensus decision-making are well-known. Consensus decision-making may draw out the decision-making process and can lead to decisions based on the lowest common denominator.
372. The NPFC has a range of subsidiary bodies which can facilitate decision-making by the Commission. The SC's subsidiary SSCs and TWGs and SWGs appear, from published reports, to provide a useful channel of information and advice from the technical experts to the SC, and then to the Commission. It was noted in a questionnaire response that the SC strives for consensus in decisions related to its scientific activities and recommendations to the Commission. Disagreements among Members have been addressed in the past through contracting an external expert to review the science, tasking an appropriate SWG to undertake further discussion and make recommendations, or the issue is revisited during a special meeting of the SC, as occurred in relation to the Pacific Saury stock assessment in January 2021. If there are different views among Members, these are reflected in the final SC report.
373. The NPFC TCC also has two SWG on Planning and Development and on Operations which report annually at the TCC meeting. Previously there were four SWG: the TCC SWG on Vessel Registry; the TCC SWG on VMS; the TCC SWG on Assessing Compliance and the TCC SWG of Operational Enforcement.⁴¹¹ In 2019 TCC recommended that the Commission consider

⁴¹¹ This SWG was established in 2018: TCC03, Final Report, para 18; COM04, Final Report, para 19.

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streamlining the four SWGs into two (policy/planning and operational enforcement).⁴¹² TCC, like the SC, strives to make its recommendations by consensus.⁴¹³

374. The Review Panel was not able to fully assess the operations or effectiveness of the TCC SWGs because their reports are not public. TCC03 made a number of recommendations based on the work of three of the SWG, which suggests that they can facilitate the work of the Commission.⁴¹⁴ However, two years later TCC05 discussed the need to progress work on monitoring and control of at-sea transshipments and noted “the need to develop a work plan for the SWG that balances making progress on the relevant tasks and not overburdening participants”.⁴¹⁵ An interviewee suggested that the SWG did not contribute significantly to efficient decision-making. Progress in the SWG is affected by the virtual nature of the meetings. In 2019 TCC04 recommended that the Commission consider having the TCC SWG meetings occur as face-to-face meetings.⁴¹⁶ COM06 accepted the recommendations of TCC04, however, meetings of the SWGs continue to operate virtually, recognising of course this has been the only option in the last two years due to the COVID-19 pandemic.
375. The Review Panel considers that SWG can operate effectively to facilitate decision-making, but they need to have clear work programs and timetables for completion of intersessional work. The use of a facilitator to guide the SWG and where possible in-person meetings can be used to make progress. A questionnaire respondent noted that intersessional TCC SWG were not open to observers, an issue that was also raised at TCC05 in February 2021.⁴¹⁷ Greater openness of TCC SWG as well as transparency in their outputs could help to bring about more efficient and effective input into TCC recommendations and Commission decisions.
376. The Review Panel was not able to observe a Commission meeting as the scheduled 2022 meeting was postponed. However, it appears from interviews and questionnaire responses that the NPFC tends to adopt informal processes to reach consensus decisions. The Panel was advised that decisions are often taken in small groups with limited membership, and then the decision is brought to the Commission plenary for adoption. The Review Panel recognizes that sensitive discussions may need to take place in small groups in order to reach consensus among those most affected, assuming the consensus holds once the issue is brought back to plenary. Such small group processes are an effective method of reaching decisions on contentious matters. However, some interviewees suggested that it was not clear whether there was any benefit from using closed decision-making processes, given the limited progress in NPFC over the last few years on some important issues. On the other hand, without such processes, progress may have been further limited.
377. According to the Terms of Reference, the Review Panel is to consider the extent to which the NPFC has transparent and consistent decision-making procedures that facilitate the adoption of conservation and management measures in a timely and effective manner. Although most questionnaire responses from Members considered that decision-making processes were effective, a few of the responses questioned the timeliness and transparency of decision-making. One

⁴¹² TCC04, Final Report, para 79; COM05, Final Report, para 25.

⁴¹³ TCC, Terms of Reference, COM05, Final Report, Annex I.

⁴¹⁴ TCC03 Final Report, paras 14-18.

⁴¹⁵ TCC05 Final Report, para 26.

⁴¹⁶ TCC04, Final Report, para 79.

⁴¹⁷ TCC05 Final Report, para 51.

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respondent observed that “decisions can often take too much time before adopting appropriate measures”. Another suggested the use of regular scheduled meetings to assist in consensus building and better decision-making. Some interviewees suggested that increased transparency can lead to better decisions because it expands the range of ideas and information on which Members can base their decisions.

6.1.1. Review Panel’s findings relating to decision-making

378. The Review Panel acknowledges the effectiveness of the consensus first/vote later approach used in the NPF Convention, and notes that the Members of NPFC strive to achieve consensus decision-making in the Commission and subsidiary bodies. The NPFC uses informal discussions as a way to achieve consensus, but in doing so care should be taken that the decision-making processes are as transparent as possible. The Review Panel also acknowledges that there is a necessary balance between facilitating timely and effective decision-making through informal small group processes, and the transparency of those processes.
379. The NPFC uses various procedural mechanisms to progress effective recommendations from the subsidiary bodies to the Commission, including small group processes to discuss and make recommendations, the use of external experts, and independent consultant advisers. The SC uses these mechanisms to good effect, but progress in TCC SWG is slower. The Review Panel encourages the continued use of these mechanisms, together with others such as the use of facilitators to make progress in TCC SWG.

6.1.2. Review Panel’s recommendations on decision-making

Recommendation 6.1.1. That the work of the TCC SWGs be facilitated by having clear work programs and timetables for completion of intersessional work, reporting against work programs in annual reports to TCC, and meetings are held where feasible in person in order to expedite progress on difficult issues in the work program.

6.2. Dispute Settlement

380. The NPFC Convention has a dispute resolution procedure which is provided for in Article 19:
- a) Contracting Parties shall cooperate in order to prevent disputes and shall use their best endeavours to resolve any disputes by amicable means which may include, where a dispute is of a technical nature, referring the dispute to an *ad hoc* expert panel.
 - b) In any case where a dispute is not resolved through the means set out in paragraph 1, the provisions relating to the settlement of disputes set out in Part VIII of the 1995 Agreement shall apply, *mutatis mutandis*, to any dispute between the Contracting Parties.
 - c) Paragraph 2 shall not affect the status Contracting Party in relation to the 1995 Agreement or the 1982 Convention.
381. These provisions are broadly consistent with those found in the constituent documents of other RFMOs, such as WCPFC and SPRFMO. They have not been used to date. However, there is nothing to suggest that the mechanisms are not adequate for resolving any future disputes among Members.

6.2.1. Review Panel's findings

382. The Review Panel notes that the Article 19 dispute settlement process has never been used since the NPFC Convention entered into force but considers it is adequate for resolving disputes among Members.

7. International Cooperation

7.1. Relationship to cooperating non-Members

383. Article 20 of the Convention provides for the Commission to cooperate with non-Parties to the Convention, including by requesting non-Contracting Parties whose vessels fish in the Convention Area to become party to the Convention or to agree to cooperate fully in the implementation of CMMs adopted by the Commission. Members of the Commission are obliged to exchange information on the activities of fishing vessels of non-Contracting Parties that are engaged in fishing in the Convention Area and to take measures to deter activities of such vessels which undermine the effectiveness of applicable CMMs. Members of the Commission are also to take appropriate measures to preventing their flag vessels from transferring their registration to non-Contracting Parties for the purpose of avoiding compliance with the Convention.
384. In order to facilitate cooperation with non-Parties, the Commission has adopted rules to recognize the status of Cooperating non-Contracting Party (CNCP).⁴¹⁸ Rule 10 of the Rules of Procedure sets out the process for recognition of CNCPs. Each year, the Executive Secretary contacts all non-Contracting Parties whose vessels fish in the Convention Area and those known to have an interest in fishing in the Convention Area, to request them to become a Contracting Party or attain the status of CNCP. Requests for CNCP status must include its reasons for seeking CNCP status, and other relevant information to support the status, including full data on historical catches and a commitment to cooperate fully in the implementation of the CMMs adopted by the Commission and an explicit commitment to accept high seas boarding and inspections in accordance with the Commission's procedures. A CNCP applicant is encouraged to make a financial contribution commensurate with what it would be assessed should it become a Contracting Party. CNCP status is reviewed by TCC and accorded by the Commission on a bi-annual basis. A CNCP seeking to renew its CNCP status must comply with Commission requirements to ensure compliance with NPFC CMMs. Once CNCP status is granted, the CNCP is to comply with all CMMs adopted by the Commission; provide all data Members of the Commission are required to submit; inform the Commission annually of the measures it takes to ensure compliance by its vessels with the Commission's CMMs; respond in a timely manner to alleged violations of CMMs adopted by the Commission and any alleged IUU activities of vessels flying its flag, and accept boarding in accordance with the Commission's high seas boarding and inspection procedures. Following the granting of CNCP status, the Commission may determine how the participatory rights of CNCPs will be limited by the CMMs adopted by the Commission. CNCPs that fail to comply with any of the CMMs adopted by the Commission are deemed to have undermined the effectiveness of the CMMs adopted by the Commission and may be subject to sanctions. This may include the revocation of CNCP status.

⁴¹⁸ This was done at the third Commission meeting: COM03 Final Report, para 48.

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385. Only one State has been granted CNCP status – Panama. It was granted CNCP status in July 2019 for one year.⁴¹⁹ This was reviewed at the following Commission meeting in February 2021, and CNCP status granted, to be reviewed at the next Commission meeting, expected in 2023.⁴²⁰
386. There has been discussion over the years in TCC and the Commission on CNCP status which, according to the Rules of Procedure is to be granted on a bi-annual basis. At COM02 in 2016, the Commission decided that further consideration was needed on whether the Commission should accord CNCP status on a bi-annual basis or an annual basis.⁴²¹ The meeting reports do not show that this was considered further by the Commission. However, CNCP status is accorded to Panama on an annual basis.
387. In 2016 Ukraine presented a proposal to conduct fishing activities in the Convention Area.⁴²² It attended the Commission meeting the following year and repeated its intention to conduct fishing activities, in particular crab, squid and finfish fisheries, in the Convention Area.⁴²³ It proposed cooperation with the NPFC as a CNCP and the Secretariat was charged with coordination with Ukraine on this.⁴²⁴ Ukrainian interest in this appeared to wane in the following year (2018).⁴²⁵ There is no evidence to suggest that Ukrainian vessels have historically, or currently are, conducting fishing activities in the Convention Area.

7.1.1. Review Panel's findings

388. The Review Panel is to consider the extent to which the NPFC facilitates cooperation between Members and CNCPs, including by encouraging them to become Members. The questionnaire responses did not indicate that there were any concerns over cooperation between Members and CNCPs. There were mixed views among questionnaire respondents as to whether the NPFC had encouraged Panama to become a Member of NPFC. A more substantive issue is the consistent application of the requirements for approving CNCP status, which should be standardised.

7.1.2. Review Panel's recommendations

389. Recommendation 7.1.1: That the Commission decide whether to grant CNCP status on a biannual or an annual basis and apply a consistent approach to the granting of CNCP status.

7.2. Relationship to non-cooperating non-Members

390. Concerns have been expressed over the years on the extent of fishing activities by non-parties to the NPFC Convention. For example, at TCC01 in 2016 Japan referred to its paper on Vessels Sighted in the Convention Area by Japan's Fisheries Enforcement Vessels,⁴²⁶ and expressed its concern that almost 200 foreign vessels were sighted just outside of Japan's EEZ.⁴²⁷ Russia voiced

⁴¹⁹ COM05 Final Report, para 13.

⁴²⁰ COM06 Final Report, para 14.

⁴²¹ COM02 Final Report, para 35.

⁴²² COM02 Final Report, para 30.

⁴²³ COM03 Final Report, para 49.

⁴²⁴ Ibid.

⁴²⁵ TCC03, Final Report, para 34.

⁴²⁶ NPFC-2016-TCC01-IP05.

⁴²⁷ TCC01 Final Report, para 9.

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similar concerns.⁴²⁸ Again at TCC02 Japan reported 288 vessels sighted in 2016 in the Convention Area, of which, 68 were suspected to be IUU vessels.⁴²⁹ Of these, Japan noted presumed instances where vessels had changed their names and cases of multiple vessels having the same name and three digit registration number.⁴³⁰ Seven cases of two vessels with the same name and three digit registration number were addressed and the seven illegal vessels added to the IUU Vessel List.⁴³¹

391. The High Seas Boarding and Inspection Procedures provide for authorized inspection vessels to engage in surveillance aimed at identifying fishing vessels of non-Members undertaking fishing activities on the high seas in the Convention area.⁴³² TCC03 recommended to the Commission that the Secretariat develop and maintain a list of vessels identified through HSBI surveillance.⁴³³ This is included on the secure side of the website.
392. Unauthorised activities in the Convention Area are also related to transshipment which is significant in the NPFC Convention Area and involves carrier vessels from a number of different flags. As noted in Section 5.3 the Commission established an Interim Vessel Register in CMM 2019-01 on vessel registration requirements which was applicable from 2017 until 2019 and permitted Members to use non-member carrier vessels included on the Interim Register to receive transshipments of fisheries resources caught in the Convention Area from fishing vessels flying the flag of Members. The Interim Non-Member Carrier Vessel Register was due to expire in 2019. The Secretariat reported that it had sent two letters to flag States of non-Member carrier vessels in August and again in October 2018 to note the proposed expiration of the Interim Register to encourage them to become CNCPs. In response Panama made an application for CNCP status and Liberia made an inquiry indicating its interest in applying for CNCP status. Liberia did not pursue this request. Other than Panama and Liberia, no other non-Member carriers responded to the letters from the Secretariat.⁴³⁴ The Commission decided to extend the Interim Register until 31 August 2020.⁴³⁵ This exemption therefore no longer applies. There are currently at least three non-Member, non-CNCP flag States with unauthorized carrier vessels operating in the Convention Area.⁴³⁶

7.2.1. Review Panel's findings

393. The issue of IUU fishing in the NPFC Convention Area is of concern, as has been noted in Chapter 5. There are acknowledged instances of unauthorized carrier vessels operating in the NPFC Convention Area. Although the problem of IUU fishing in NPFC appears to be significant, there is a lack of serious efforts to encourage the flag States of vessels that undertake fishing or transshipment activities in the Convention Area to seek CNCP status. Given the role that transshipment plays in the NPFC Convention Area, this should be addressed by the Commission. Efforts could include tasking the Secretariat to re-new efforts to contact all non-Contracting Parties whose vessels fish or tranship in the Convention Area and those known to have an interest in

⁴²⁸ TCC01 Final Report, para 10.

⁴²⁹ TCC02, Final Report, para 21.

⁴³⁰ Ibid.

⁴³¹ TCC 02 Final Report, para 26.

⁴³² CMM 2017-09, para 43.

⁴³³ TCC03, Final Report, para 48(t).

⁴³⁴ TCC04 Final Report, para 30.

⁴³⁵ COM05 Final Report, para 23.

⁴³⁶ It is not clear to the Review Panel whether these vessels are supporting the operations of Members' fishing vessels.

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fishing in the Convention Area, to request them to become a Contracting Party or attain CNCP status. If the flag States do not do so, the vessels concerned should be included on the NPFC IUU Vessel List. Members whose flag vessels utilise the services of vessels that are flagged to non-Contracting Parties should take appropriate domestic action to prohibit the utilisation of those services.

7.2.2. Review Panel's recommendations

Recommendation 7.2.1: That the Commission task the Secretariat to contact the flag States of fishing vessels and carrier vessels that are not authorized to fish in the Convention Area and those known to have an interest in fishing in the Convention Area and encourage them to seek CNCP status in NPFC and for the Secretariat to provide the Commission with an annual report on such outreach and on non-cooperating non-Member activities.

Recommendation 7.2.2: That the Commission revise CMM 2016-03 to require Members to prohibit vessels flying their flag from utilising the services, including transshipment services, of vessels that are flagged to non-contracting parties that are not CNCPs in the Convention Area.

Recommendation 7.2.3: That where carrier vessels of non-contracting Parties and non-CNCPs are confirmed to have undertaken transshipment in the NPFC Convention Area of fisheries resources managed by NPFC, the vessels concerned should be placed on the NPFC IUU Vessel List in accordance with IUU vessel listing procedures.

7.3. Cooperation with other international organizations

394. Article 21 of the NPFC Convention requires the Commission to cooperate with the FAO and relevant regional organizations or arrangements, especially with those with responsibility for fisheries in marine areas near or adjacent to the Convention Area. Article 21 envisages cooperation in a number of different areas: taking into account the conservation and management measures of RFMOs in adjacent areas in respect of species belonging to the same ecosystem; utilizing existing institutions to achieve the objective of the Convention; and cooperating in enforcement activities. The overall objective is to develop cooperative working relationships with intergovernmental organizations that can contribute to its work and with adjacent RFMOs.
395. The topic of cooperation with other organizations was raised at the 1st Scientific Committee meeting which noted that there are two levels of cooperation:⁴³⁷
- a) Mutual observers to each other's meetings to strengthen scientific information exchange and cooperation; and
 - b) Higher level and more formal cooperation through a memorandum of understanding whereby there is cooperation and active exchange of information or cooperative actions between organizations.
396. Subsequently the SC recommended that Members engage in more proactive cooperation with other organizations.⁴³⁸ It has included activities relating to cooperation with other organizations in its Research Plans, including the current Plan (2021-2025). The Commission agreed to enhance

⁴³⁷ SC01 Final Report, para 42.

⁴³⁸ SC02 Final Report, para 69.

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cooperation with other organizations in order to complement the objectives and activities of the NPFC.⁴³⁹

397. NPFC has strong cooperative relationships with the North Pacific Marine Science Organization (PICES) and the North Pacific Anadromous Fish Commission (NPAFC) as well as with the Food and Agriculture Organization (FAO). It is seeking to develop its relationships with other international organizations, particularly adjacent or overlapping RFMOs.
398. Cooperation with PICES in the scientific field appears to have been excellent. In 2017 the NPFC and PICES established a joint PICES-NPFC Study Group to identify opportunities for scientific cooperation between the two organizations.⁴⁴⁰ The Study Group developed a NPFC-PICES Framework for Enhanced Scientific Collaboration in the North Pacific which identified three broad areas of joint interest on which collective progress was anticipated over the following five years: (i) support for stock assessment for priority species; (ii) vulnerable marine ecosystems; and (iii) ecosystem approach to fisheries, with the first two being high priority areas for cooperation.⁴⁴¹ Mechanisms for collaboration have included joint workshops and symposia, and observer/expert participation in each other's meetings. This demonstrates a structured approach to cooperation between NPFC and PICES which appears to be valued by both sides.
399. NPFC and NPAFC signed a Memorandum of Cooperation (MOC) in May 2019. The MOC provides for cooperation on matters of common interest (such as stocks and by-catch) including exchange of data and information, collaboration on research efforts on species of mutual interest and implementation of CMMs. NPFC may also share certain information about salmon bycatch or retention of salmon with the NPAFC, on a voluntary basis.⁴⁴² TCC has indicated that this data sharing is for the scientific purposes, rather than compliance purposes.⁴⁴³ There has also been interest in a multinational research survey on salmon in the North Pacific and the potential for cooperation in NPAFC on air surveillance of the North Pacific by the NPAFC to combat IUU fishing in the Convention Area.⁴⁴⁴ Again there is a structured approach to cooperation between NPFC and NPAFC. Both the SC and TCC have reviewed a draft five-year Work plan to implement NPAFC/NPFC Memorandum of Cooperation, 2021-2025, proposed by the Executive Director of the NPAFC, and incorporated the SC-related items,⁴⁴⁵ and the compliance-related matters into the MoC Work Plan.⁴⁴⁶ The Secretariat is to liaise with NPAFC to continue work to finalize the Plan.⁴⁴⁷ NPFC maintains a NPFC-NPAFC facility on the NPFC website for information sharing between the two organizations.
400. NPFC is also part of the FAO Areas Beyond National Jurisdiction (ABNJ) Deep Seas Project and engages in cooperation on the management of deep-sea fisheries and protection of marine ecosystem. FAO shared its information on the VME ecosystem database with the SSC VME and

⁴³⁹ COM03, Final Report, para 43.

⁴⁴⁰ COM03, Final Report, Annex G.

⁴⁴¹ SC04, Final Report, Annex K; COM05, Final Report, para 42.

⁴⁴² Memorandum of Cooperation, NPFC and NPAFC.

⁴⁴³ TCC04 Final Report, para 51.

⁴⁴⁴ COM04, Final Report, para 39.

⁴⁴⁵ SC06 Final Report, paras 49, 50 and Annex P.

⁴⁴⁶ TCC05 Final Report, Annex D.

⁴⁴⁷ TCC05 Final Report, para 16; COM06 Final Report, para 35.

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encouraged NPFC to actively participate in the database development exercise.⁴⁴⁸ A NPFC/FAO workshop was held in March 2018, which provided a strong foundation for VME-related work.⁴⁴⁹ SC4 has also endorsed the use of FAO's publicly-available VME Map as a template for developing the NPFC's own VME map.⁴⁵⁰ The SC has considered and supported the NPFC entering into an arrangement with FAO's Fisheries and Resources Monitoring System (FIRMS) Partnership.⁴⁵¹ Collaboration between NPFC and the FAO Global Record of Fishing Vessels on a project to use AIS data technology for scientific analyses has been supported,⁴⁵² as well as possible collaboration with FAO in relation to sharing vessel data for the Global Record of Fishing Vessels.⁴⁵³

401. The Commission has recognized the potential value of cooperation with other organizations, such as WCPFC, SPRFMO, NAFO and IATTC, but agreed that any such cooperation must contribute to the mission of the NPFC.⁴⁵⁴ Progress has been made in cooperative arrangements with SPRFMO, WCPFC, and IATTC.⁴⁵⁵ Some of these have been delayed as a result of the COVID-19 pandemic and the reduced bandwidth to consider substantive issues during virtual meetings.

7.3.1. Review Panel's findings

402. The Review Panel appreciates that the NPFC has entered into structured collaborative relationships with PICES and NPAFC which are valuable and have good potential. There may be a need for care, as noted in a questionnaire response, that cooperation plans are not overly ambitious. The NPFC Convention Area is adjacent to, or overlaps, the areas of competence of other RFMOs in the Pacific Ocean. There has been little attention paid to the compatibility of procedures and processes between NPFC and these other RFMOs nor to enhancing common standards for fleets. The Review Panel considers that cooperation with these other organizations requires bolstering, not only in the area of science, but also in the area of compliance, including by providing sufficient funding for this purpose. This should extend where feasible to the sharing of information and exploring opportunities to collaborate on the development of information management systems. In general, however, cooperation with other organizations must contribute to the mission of the NPFC.

7.3.2. Review Panel's recommendations

Recommendation 7.3.1: That the Commission task the Executive Secretary, in consultation with Members, to develop a prioritized program of work to strengthen practical cooperation with other organizations, including on data sharing and data management. This should include collaboration with WCPFC and IATTC as a priority.

Recommendation 7.3.2: That in addition to the development of any necessary formal linkages through MOUs, the Secretariat be encouraged to engage informally with staff in other RFMOs, including through the IMCS Network, to learn and share experiences of operational activities.

⁴⁴⁸ SC01 Final Report, para 9.

⁴⁴⁹ SC03 Final Report, para 6 and 37.

⁴⁵⁰ SC04 Final Report, para 10.

⁴⁵¹ SC05 Final Report, para 54 and 55; SC06 Final Report, para 51 and 52.

⁴⁵² SC05 Final Report, para 59.

⁴⁵³ TCC04 Final Report, para 40 and SC06 Final Report, para 55-56.

⁴⁵⁴ COM04 Final Report, para 42.

⁴⁵⁵ COM05 Final Report, paras 46-48.

7.4. Special requirements of Developing States

403. Unlike the Conventions establishing some other RFMOs, such as WCPFC and SPRMO, there is no provision in the NPFC Convention which requires the Commission to give full recognition to the special requirements of developing State Contracting Parties in the region, in particular small island developing States, in relation to the conservation and management of fishery resources in the Convention Area. Although the NPFC Convention does not specifically include such a provision, Article 24 of the UN Fish Stocks Agreement is relevant and provides for recognition of the special requirements of developing states, while Article 25 sets out the forms of cooperation with developing countries, including enhancing their ability to develop their fisheries and providing assistance to improve conservation and management and monitoring, control, surveillance and enforcement. Article 28 of the NPFC Convention makes clear that the rights, jurisdiction and duties of Parties to the UN Fish Stocks Agreement are not to be prejudiced by the Convention.
404. The Performance Review criteria provide that the Review is to assess:
- Extent to which the NPFC recognizes the special needs of developing States and pursues forms of cooperation with developing States, including with respect to fishing allocations or opportunities, taking into account UNFSA Articles 24 and 25, and the Code of Conduct of Responsible Fisheries Article 5.
405. NPFC has one Member which is a small island developing State: Vanuatu. At its meeting in 2021 the SC “noted that Vanuatu is a small island developing state which is still developing its fishery, and that Vanuatu urges the SC to consider its aspirations when making recommendations to the Commission”.⁴⁵⁶ At COM06 in 2021, Vanuatu presented a proposal to amend CMM 2019-08 for Pacific Saury to take into consideration the interests of small island developing States when revising the CMM in future (NPFC-2021-COM06-IP04).⁴⁵⁷ The Commission adopted a revised CMM for Pacific Saury which included the following paragraph:
17. Consideration should be given to development aspirations of small island developing States in accordance with international law in revising this CMM.

7.4.1. Review Panel’s findings

406. The special requirements of small island developing States has not received much attention in the NPFC. This may be due to the impression, which the Review Panel has heard expressed, that Vanuatu is operating in the NPFC as a fishing nation, not as a small island developing State. The NPFC Convention does not require the Commission to give full recognition of the special requirements of developing States, and in particular small island developing States, but this is recognized in the UN Fish Stocks Agreement and the Code of Conduct for Responsible Fisheries. The UN Fish Stocks Agreement draws no distinction between small islands developing States that are fishing nations and those that are not, and indeed is explicit in requiring cooperation to assist small island developing States to enable them to participate in high seas fisheries.

⁴⁵⁶ SC05 Final Report, para 13.

⁴⁵⁷ COM06 Final Report, para 50.

7.4.2. Review Panel's recommendations

Recommendation 7.4.1. That the Commission demonstrate consideration of the special requirements of developing States, in particular SIDS, in its decision-making.

7.5. Transparency

407. Article 18 of the Convention requires the Commission to promote transparency in its decision making processes and other activities carried out under the Convention. It provides for representatives from intergovernmental organizations and non-governmental organizations concerned with matters relevant to the implementation of this Convention to be afforded the opportunity to participate in the meetings of the Commission and its subsidiary bodies as observers and as provided for in the Rules of Procedure, which shall not be overly restrictive in this respect. Intergovernmental organizations and non-governmental organizations are to be given timely access to pertinent information subject to the rules and procedures that the Commission may adopt. Article 18 also provides that any conservation, management and other measures or matters that are decided by the Commission or subsidiary bodies shall be made publicly available unless otherwise decided by the Commission.
408. Rule 9 of the Commission Rules of Procedure provides for the participation of observers of non-Members which participated in the Multilateral Meetings on the Management of High Seas Fisheries in the North Pacific Ocean,⁴⁵⁸ have jurisdiction over waters adjacent to the Convention Area, or which have an interest in the work of the Commission and are invited by the Commission; the FAO, specialised agencies, RFMOs, and other intergovernmental organizations (IGOs), independent experts and other advisers invited by the Commission; and non-governmental organizations (NGOs) accredited by the Commission in accordance with the Rules of Procedure. NGOs must request to participate as an observer 60 days in advance of a meeting and provide required information including a description of its mission, how its mission and activities are related to the work of the Commission. Participation is accepted unless a simple majority of Members objects within 30 days of the opening of the meeting. Observer status remains in effect for future meetings unless the Commission decides otherwise.
409. The Rules of Procedure also provide for the participation of observers in similar terms to other RFMOs. Observers are able to participate in all meetings, including subsidiary bodies, unless they are closed meetings. They are able to present information papers to meetings, make oral statements upon invitation of the Chair, are to be given timely access to all documents subject to the terms of the confidentiality rules that the Commission may decide and may make submissions for consideration during the preparation of meeting reports. There are some restrictions on their participation, such as no recording of the meeting, no press statements during the meeting on agenda items under discussion, and no disclosure of information acquired during the meeting until after its adjournment. The Executive Secretary may also limit the number of participants from each NGO accredited to participate as an observer, taking into account the total number of NGOs wishing to participate and the capacity of the meeting room. The Commission may require NGOs

⁴⁵⁸ This applies until their respective ratification, acceptance, approval, accession or expression of firm commitment becomes effective in accordance with Article 25 or the Annex of the Convention.

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to pay reasonable fees to cover costs attributable to their attendance. However, the Commission has agreed not to apply a fee to observers.⁴⁵⁹

410. The number of observers participating in meetings of the Commission has varied from year to year and not all observers attend each year. Five IGOs and nine NGOs covering a range of fishing and environmental interests have obtained observer status.
411. The Convention's transparency provisions are generally consistent with Article 12 of the UN Fish Stocks Agreement and paragraph 7.1.9 of the FAO Code of Conduct on Responsible Fisheries which strongly encourages transparency in fisheries management and decision-making. The Commission may invite independent experts to attend meetings, which is a useful mechanism to facilitate resolution of issues.
412. Although the Convention and the Rules of Procedure are sound, their implementation hampers the full participation of observers. Concerns over transparency was a consistent refrain both in the questionnaire responses and in interviews.
413. This led a group of NGOs to write to the Executive Secretary and Chair of the NPFC in March 2020 expressing concerns over the level of transparency being applied by NPFC, and to an observer paper tabled at TCC05 on the issue.⁴⁶⁰ The issues raised included that observers were not permitted access to all meetings of the Commission and subsidiary bodies, including informal meetings; meeting documents were not made publicly available on the NPFC website in good time before meetings, and compliance reports were not made available to observers.⁴⁶¹ At TCC05 some Members noted the importance of transparency and supported the general intentions of the NGOs.⁴⁶² TCC05 recommended that the Commission, give consideration to the observation by Pew and other NGOs,⁴⁶³ but this was not substantively discussed at COM06. Interim Rules relating to Transparency for TCC have been tabled for consideration by TCC06 when this is held.⁴⁶⁴

7.5.1. Review Panel's findings on transparency

414. In the view of the Review Panel, transparency and the effective participation of observers in the work of an RFMO is crucial for the good governance and legitimacy of the organization. Transparency assists decision-making through broadening the access of Members to ideas and information. It helps to promote public awareness of the organization, public confidence in the organization and support for its work. Transparency is enhanced when decisions, meeting reports and scientific analysis of an RFMO are openly available.⁴⁶⁵
415. Transparency is less of an issue for SC than for TCC. TCC's small working groups, which discuss new or amended measures and the implementation of existing measures, are not open to observers. The lack of transparency is sometimes justified on confidentiality grounds. However, concerns over confidentiality of data can be resolved through open and transparent data security protocols. The signing of confidentiality agreements by observers prior to receipt of confidential documents

⁴⁵⁹ COM03 Final Report, para 47.

⁴⁶⁰ NPFC-2021-COM06-OP02.

⁴⁶¹ TCC05 Final Report, para 51.

⁴⁶² TCC05 Final Report, para 52.

⁴⁶³ Ibid.

⁴⁶⁴ NPFC-2022-TCC06-WP17.

⁴⁶⁵ The issues with regard to the website are examined in Chapter 8.

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would address such concerns. The Review Panel encourages the development and adoption of a transparency policy which balances concerns over confidentiality with the need for open and transparent decision-making processes and which applies across the Commission and its subsidiary bodies.

7.5.2. Review Panel's recommendations

Recommendation 7.5.1. That Commission adopt, on advice of TCC, data security protocols which would enable observers, on signing of confidentiality agreements, to have access to data and information and access to meetings where such data and information is discussed.

Recommendation 7.5.2. That the Commission agree to the principle that meetings, including subsidiary body meetings, will be open to observers subject to rules of procedure which support that principle and are closed to observers only when strictly necessary.

8. Financial and Administrative Issues

8.1. Availability of resources for NPFC activities

416. Article 12 of the NPFC Convention provides for the Commission to adopt by consensus an annual budget for each of the next two years, based on a draft prepared by the Executive Secretary. Members' contributions to the budget are determined according to a formula which was initially agreed at the Second Session of the Preparatory Conference in February 2012,⁴⁶⁶ before being adopted as part of the Financial Regulations at the 1st Commission meeting.⁴⁶⁷ The formula provides that:⁴⁶⁸
- (a) 35 percent of the budget is divided equally among members of the Commission;
 - (b) 55 percent of the budget is divided proportionally among members of the Commission based on a three-year average of the total catches by weight in the Convention Area of the species covered by the Convention; and
 - (c) 10 percent of the budget shall be divided proportionally among the Member's based on each Member's Gross Domestic Product (GDP) per capita.
417. To account in part for the additional costs of hosting the Secretariat in Tokyo, it was agreed at COM01 in 2015 that Japan would pay an annual fixed contribution of 44 million yen.⁴⁶⁹ This fixed payment has continued on the same basis to date. Contributions from Members to the budget have remained stable over the last 5 years. Members consider that this is consistent with principle of ensuring that their contributions do not increase from previous levels.⁴⁷⁰ Members consistently pay their contributions in a timely manner. No significant issues have been brought to the attention of the Commission regarding any Member being in arrears.

⁴⁶⁶ Report Second Session of the Preparatory Conference of the NPFC, para 5.

⁴⁶⁷ COM01 Final Report, para 6(a).

⁴⁶⁸ Financial Regulations, reg. 12.

⁴⁶⁹ COM01 Final Report, para 6(c).

⁴⁷⁰ Draft Commission Budgets 2022-2025, NPFC-2022-FAC05-WP01 at p. 5.

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418. The agreed budget for the year 2016 was JPY 134 million,⁴⁷¹ and for 2017 was JPY 141 million.⁴⁷² From 2018 until 2021 the annual budget was JPY 157 million. There is a projected increase in the annual budget for the years 2022 to 2026 to JPY 164 million. The increase is solely attributable to the additional contribution from the EU as a new Member of the NPFC.
419. The Financial Regulations provide for the excess of appropriations over expenditures in a budget year to be transferred to the Working Capital Fund or designated for a specific purpose as determined by the Commission.⁴⁷³ Transfers to the Working Capital Fund are capped at an amount equivalent to the funds required to sustain the Commission's operation for a set number of months, as recommended by the NPFC auditors.⁴⁷⁴ If the Working Capital Fund exceeds this cap the Commission may decide to refund to Members the excess amount accrued in the Working Capital Fund.⁴⁷⁵
420. Budget surpluses have accrued in over the last several years. The surplus in 2018 amounted to JPY 42.9 million, JPY 24.5 million yen in 2019; and JPY 43.6 million in 2020. Additional surpluses are expected in 2021 and 2022 due to NPFC meetings being held virtually. Most of these funds have been transferred to the Working Capital Fund. In 2017 and 2018 the auditors recommended that the Working Capital Fund be capped at 6 months of operational expenses,⁴⁷⁶ and this was accepted by the Commission.⁴⁷⁷ Due to successive surpluses the Working Capital Fund had increased to JPY 156.7 million by the start of 2022, approximately 12 months of operating expenditures.⁴⁷⁸ Additional unspent funds from the annual budget which do not go to the Working Capital Fund are transferred to the Special Project Fund, which had a balance of JPY 36.5 million at the start of 2022.
421. The establishment of a Special Projects Fund was envisaged in reg 24 of the NPFC Financial Regulations and agreed at COM03.⁴⁷⁹ The objectives of the Special Projects Fund are to address special science and compliance initiatives, especially costly non-recurring projects such as the establishment of key tools for science, compliance and management, including database development and set-up; observer program set up; and regional VMS set up.⁴⁸⁰ This is a useful initiative, with a clear policy on its use. However, despite some encouragement, there have been no applications to the Special Projects Fund to date. Members appear to have preferred to bear the cost of their own projects themselves. Nevertheless, the Special Projects Fund provides a useful avenue of funding for a one-off project, such as a joint survey of Pacific saury by all Members participating in the fishery.
422. Financial resources can also be supplemented by voluntary contributions. The Financial Regulations provide for the acceptance of voluntary contributions from Members and non-

⁴⁷¹ COM02 Final Report, page 109.

⁴⁷² FAC01 Final Report, Annex F.

⁴⁷³ Financial Regulations, reg. 18.

⁴⁷⁴ Financial Regulations, reg. 22.

⁴⁷⁵ Financial Regulations, reg. 25.

⁴⁷⁶ Annual Financial Statement and Auditor Report, 31 March 2017, NPFC-2017-FAC01-IP02; Annual Financial Statement and Auditor Report, 31 March 2018, NPFC-2018-FAC02-IP01.

⁴⁷⁷ COM04 Final Report, para 21, accepting the recommendations of FAC02.

⁴⁷⁸ NPFC-2022-FAC05-WP01 Draft Commission Budgets 2022-2025.

⁴⁷⁹ NPFC-2017- FAC01-WP02; COM03 Final Report, para 27.

⁴⁸⁰ FAC01 Final Report, Annex D.

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Members, if consistent with the policies, aims, and activities of the Commission.⁴⁸¹ Voluntary contributions were received from the USA in 2018 (JPY 4.4 million) and from China in 2019 (JPY 2.2 million) and in 2021 (JPY 2.4 million). In addition, Panama, as a CNCP, made a voluntary contribution of JPY 7.1 million in 2021.

423. Members have consistently applied a cautious approach to increasing budgets. For example, in 2019, in response to a suggestion that contributions might be reduced, the FAC noted that although there was a surplus in the budget for 2019, it would be prudent to keep the overall budgetary contribution at a similar level in 2020-2022 so as to maintain the robustness of the NPFC and its Secretariat.⁴⁸²
424. The NPFC Financial Regulations provide some flexibility with regard to financial management which include mechanisms to smooth out annual contributions through transfers of funds from the Working Capital Fund to the Operating Fund, the ability to fund discrete projects through the Special Projects Fund, and the facilitation of transfers between budget categories.⁴⁸³ As the Working Capital Fund supports a healthy budget balance, there has not been the need to use these other mechanisms to account for the variability in annual expenditures. In addition, due to the apparent reluctance of Members to increase contributions, contributions tend to determine budgets; budgets are not necessarily based on needs. One respondent to the questionnaire made the following comment with which we agree:

The level of funding annually available is based on a formula for contributions by members, rather than on the needs of the NPFC to address all of the activities required to fulfil the objectives of the Commission. While there is currently a surplus of funds due to COVID related reductions in spending, it's not clear whether the formula-based funding will be sufficient to sustain the activities of the Commission in the long term.

425. In a typical year about 50 percent of the budget is spent on personnel costs. During the Preparatory Conference it was envisaged that the Secretariat would be small, comprising a minimum of three professional staff and one General Services staff.⁴⁸⁴ The staff complement now consists of three professional staff and two General Services staff. This staffing level is supplemented by interns and secondments.
426. Two years after its establishment, the Commission contracted a consultant familiar with the institutional and corporate arrangements of RFBs to provide recommendations on NPFC staffing, remuneration and a performance review system. The Commission had decided at its third meeting to recruit a Finance Officer. The consultant recommended that the positions of Executive Assistant and Finance Officer be combined on the grounds that it was difficult to justify a full-time Finance Officer at the Secretariat.⁴⁸⁵ However the Commission, on the recommendation of FAC02, decided not to accept this recommendation, or to continue with the recruitment of a Finance Officer. Instead,

⁴⁸¹ Financial Regulations, reg. 26.

⁴⁸² FAC03 Final Report at para 8.

⁴⁸³ Financial Regulations, reg. 19.

⁴⁸⁴ Record of the 3rd Session of the Preparatory Conference for the NPFC at para 7a and Attachment 3.

⁴⁸⁵ Edward Kremzer, Consultancy Report: Staffing, Remuneration and Performance Review, July 2018, NPFC-2018-FAC02-WP03, p. 15-16.

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they decided to procure any support for financial work from an external service provider under the overall direction of the Executive Secretary.⁴⁸⁶

427. Until August 2021 a part-time external contractor provided financial assistance to the Secretariat. However, it has proven difficult to hire a competent finance expert with English language skills on a short-term basis, especially as NPFC remuneration is less than that provided by local companies. As the Secretariat's ongoing financial accounting needs are not substantial,⁴⁸⁷ the current practice is for financial accounting to be handled within current Secretariat resources by the Executive Assistant and Executive Secretary. Expenditures are checked against the budget monthly, but for internal purposes only. Before the end of the financial year, a contracted internal auditor ensures that the financial statements prepared by the Executive Secretary are in order. These are reviewed by the external auditor and the audited figures are presented to the Commission at the annual meeting.
428. The arrangements for the provision of financial support to the Secretariat are not sustainable in the longer term. There is a lack of financial expertise within the Secretariat which hinders the timeliness of assessing expenditures against budgets and in presenting up-to-date expenditure figures to the Commission. Despite significant budget surpluses, the lack of financial expertise at the Secretariat means that NPFC has not developed an investment policy in order to achieve a reasonable low-risk return on those surpluses.
429. An examination of the questionnaire responses shows diverse views of Members on whether the level of funding available to the Secretariat is sufficient to achieve the aims of the NPFC. There is general agreement that it is not a question of the level of funds available to the Secretariat, but the staffing resources available to effectively use the funds that are available.
430. As the NPFC has expanded its program of work, the Secretariat resources have not kept pace. One respondent noted that if additional demands are placed on the Secretariat to implement additional MCS measures, such as regional VMS and transshipment management, the current funding level to the Secretariat and its staffing levels may not be sufficient. The Review Panel concurs with this assessment. Where the Commission adopts CMMs which are associated with additional responsibilities for the Secretariat, there should be a transparency process to ensure that the Secretariat support necessary for the implementation of the CMM is made clear at the time of the CMM's adoption.⁴⁸⁸
431. The Secretariat resources are supplemented to some extent through the NPFC intern and secondment program. The internship program helps early-career professionals to gain experience and knowledge of Commission operations and assists in increasing the capacity of the NPFC Secretariat.⁴⁸⁹ Interns receive JPY 200,000 per month to assist with living and accommodation costs. Internships are approved annually by the Commission. While the acceptance of interns would usually be a matter for the Executive Secretary of an RFMO, the Commission justifies its role because it makes a part payment to interns and for this reason it approves their acceptance.

⁴⁸⁶ COM04 Final Report, FAC02 Final Report, para 11.

⁴⁸⁷ Approximately 700 transactions/documents per annum.

⁴⁸⁸ This would require proponent Members to consult with the Secretariat regarding cost implications in advance of the tabling of a proposal for the Commission's consideration. Provisional budgets would incorporate any such costings, subject to adoption of the CMM by the Commission.

⁴⁸⁹ See <https://www.npfc.int/internship>.

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432. Secondments are for mid-level or senior technical specialists from Member countries who spend up to one year at the Commission.⁴⁹⁰ Participants in the secondment programme are also approved by the Commission. A Japanese secondee has been approved to provide assistance on compliance issues for 12 months commencing in 2022. Secondees are a useful alternative to increasing staff numbers. Secondments, especially at middle levels, can be a win-win: drawing from the secondee's experience to assist with work program activities at the Secretariat and giving the secondee the opportunity to learn the operations of NPFC and, more broadly, RFMOs. The Review Panel supports this continuing.
433. Notwithstanding the intern and secondment programs, the Secretariat staff resources are insufficient for NPFC to undertake additional responsibilities. There is also a question of how best to ensure that the Secretariat has the right capabilities, including in the area of finance and administration, to ensure that it fulfils the expectations of the Commission. The next Executive Secretary should give early attention to this issue.

8.1.1. Review Panel's findings

434. The Review Panel acknowledges that the formula for Member contributions was agreed at an early stage of the Preparatory Conference. It has endured over the last decade and provides financial stability in the contributions of Members. Members of NPFC pay their contributions in full and in a timely manner and this is to be commended. The consistency in the annual budgets ensures that Members know their expected contributions from year to year. However, this has the consequence that it is difficult to increase the budget to address specific issues, such as staffing. Despite this, there have been budget surpluses in recent years, which have been allocated to the Working Capital Fund and the Special Projects Fund.
435. The NPFC Secretariat is a lean organization. It gains additional staff resources from the intern and secondment programs, which are valuable and should be continued. However, there is a question whether the current staff establishment is sustainable in the longer term. If additional demands are placed on the Secretariat to implement additional measures the current funding level to the Secretariat and its staffing levels may not be sufficient and will require review. The NPFC has a number of important tasks to accomplish in the near term, in particular the development of MPs and HCR for NPFC priority stocks, and the further development of the suite of MCS measures that are international best practice for RFMOs. This will require additional dedication from Members, including personnel and financial resources, so that the NPFC can fulfil all the objectives for the organization set out in the Convention.

8.1.2. Review Panel's recommendations

Recommendation 8.1.1: That the Commission encourage the SC and TCC to develop proposals for funding consideration from funds set aside in the Special Projects Fund.

Recommendation 8.1.2. That the Commission, through NPFC Members, increase efforts to advance the Commission's work, in particular the development of Management Procedures (MPs) and Harvest Control Rules (HCR) for NPFC priority stocks, and the adoption and implementation of priority MCS measures.

⁴⁹⁰ See <https://www.npfc.int/secondment>.

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Recommendation 8.1.3: That proposals for new or revised conservation and management measures be accompanied by costings associated with additional responsibilities for the Secretariat to provide the support necessary for the implementation of the CMM and that this be endorsed by the Commission for inclusion in the budget at the time of the CMM's adoption.

Recommendation 8.1.4: That the new Executive Secretary undertake a review of staffing levels in the Secretariat, capabilities, and needs of the organization, with a view to presenting comprehensive proposals on staffing to the Commission in 2024.

8.2. Efficiency and cost effectiveness

436. Members generally consider that the NPFC efficiently and effectively manages the financial and human resources available to it. The Secretariat has hardworking staff who have adapted to the additional duties required of them as the organization has grown and have demonstrated flexibility in responding to extraordinary circumstances such as COVID-19. The NPFC auditors have consistently given the NPFC a clean audit and this is commendable. There are, however, a few issues that have been identified concerning the preparation of financial reports, assessment against work plans, staff performance, remuneration of professional staff, and website management.
437. It has been suggested that the financial reports of expenditure against budgets are not as expeditiously presented to Members as would normally be expected. The adoption of budgets without actual expenditures for the prior year being finalised requires necessary readjustment of the budget.⁴⁹¹ This may be due in part to the Commission meeting occurring towards the end of the NPFC financial year and to the desire to wait for audited accounts before providing Members with details of expenditures against appropriations. Best practice is to include financial expenditures that are as up-to-date as possible, together with outstanding anticipated commitments, when considering budget proposals.
438. The Secretariat produces an annual work plan to accompany its annual budget proposal.⁴⁹² As TCC and FAC meetings are held in conjunction with the Commission meeting it is not possible to incorporate the TCC work plan in the Secretariat's work plan. To address this, the FAC requested that the TCC develop a rolling two-year work plan.⁴⁹³ The Secretariat reports to the Commission against the work plan to each meeting of the FAC.⁴⁹⁴ Aside from the work plan there is no other organizational document which sets out the goals and objectives of the organization, the strategic priorities of the organization or Secretariat, or the tasks of the organization and the Secretariat. Such a document would flow into individual staff work plans and would assist in an objective annual performance review.
439. The 2018 Consultancy recommended that the NPFC develop a Strategic Plan for the Commission, which was endorsed by FAC02 and COM04.⁴⁹⁵ At the request of FAC02, the Secretariat presented the proposed process and timeline for the development of a Strategic Plan, as well as a template

⁴⁹¹ For example, COM04 adopted the 2019 budget, but this was adjusted in light of actual expenditures in 2018: FAC02 Final Report, para 8; COM04 Final Report, para 21.

⁴⁹² As requested at the 1st FAC Special Working Group: COMM2, Annex H, at para 11.

⁴⁹³ FAC01 Final Report, para 9.

⁴⁹⁴ FAC01 Final Report, para 8; FAC02 Final Report, para 7; FAC03 Final Report, para 9 and FAC04 Final Report, para 5.

⁴⁹⁵ FAC02 Final Report, para 11; COM04 Final Report, para 21.

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for the draft plan containing vision, mission, goals and objectives.⁴⁹⁶ This was endorsed by the Commission.⁴⁹⁷ However, it has not been developed further by the Commission.

440. It was suggested to the Review Panel during interviews that this was due in part to Members giving priority to other issues on the agenda of the Commission. It may also be due to the difficulty of reaching agreement on a Strategic Plan for an organization, as compared with a plan for the Secretariat. A Corporate Plan is a valuable management tool that assists in ensuring that the Secretariat's role in supporting the work of the Commission is clearly described, expectations and accountabilities are elaborated, and staff and financial resources appropriately allocated. The Review Panel encourages the Commission to complete the process initiated in 2018 and for the Secretariat to develop and the Commission adopt a Corporate Plan for the Secretariat.
441. In response to the Consultant's recommendation on the development of a performance review system, FAC02 recommended that the Commission task the Secretariat to develop a plan for implementing a 360-degree performance review involving mutual performance reviews among Secretariat staff.⁴⁹⁸ In adopting the plan,⁴⁹⁹ COM06 accepted the FAC03 recommendation that the individual assessments would be shared between the NPFC Chair, NPFC Vice-Chair and the individual staff member, prior to a summary analyses being released to the heads of delegation to assist in capacity development of the Secretariat staff.⁵⁰⁰
442. In this way, from January 2020, the Commission has involved itself in 360 degree performance reviews of all staff, not just the Executive Secretary as is normally the case. Performance reviews in other organizations are usually within the competence of the Executive Secretary. The involvement of Heads of Delegation may serve to disempower the Executive Secretary from having full responsibility and accountability for the performance of his or her staff. The Review Panel is of the view that this role should rest solely with the Executive Secretary, who would report, as appropriate, to the Commission as part of the annual report on the operations of the Secretariat from the Executive Secretary.
443. The Review Panel was advised of some apparent anomalies in the setting of staff remuneration levels and allowances. This has arisen in three main areas: the setting of salaries at a fixed rate of Japanese yen to the US dollar, the implementation of full UN ICSC salary and benefits; and the treatment of allowances associated with staff accommodation.
444. The salary of professional NPFC staff was based on the United Nations pay scale in US dollars at the time of recruitment, converted to yen at an exchange rate of 124.36 of Japanese yen to the US dollar. As weakened exchange rates in the first years of Commission's operation impacted on the purchasing power of professional staff, the First meeting of the FAC Special Working Group in 2016 recommended that staff be paid a set amount in Japanese yen to avoid exchange rate issues.⁵⁰¹ Following consideration of options, it was decided to peg the exchange rate at 124.36 JPY to 1

⁴⁹⁶ NPFC-2019-COM05-WP10.

⁴⁹⁷ COM05 Final Report, para 50.

⁴⁹⁸ FAC02 Final Report, para 11.

⁴⁹⁹ NPFC-FAC03-2019-WP05 and FAC03 Final Report, para 15.

⁵⁰⁰ COM06 Final Report rev 1, para 43. FAC04 Final Report, para 10.

⁵⁰¹ 1st Meeting of the Finance and Administration Special Working Group, Final Report, para 10.

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USD.⁵⁰² This addressed the immediate issue, but it may pose issues in the future if the JPY to USD exchange rate moves in the other direction, as is already occurred.

445. The implementation of the UN ICSC salary and benefits is also an anomaly where the principle is to adopt UN ICSC salary and benefits, but the reality is not quite the same. The 2018 Consultancy recommended that the Commission consider implementation of full UN ICSC Salary and Benefits, including the Accommodation Subsidy and also the special requirements in Tokyo for two yearly rental renewal costs. In the context of decisions on the exchange rate for professional staff, the Commission decided not to adopt a post adjustment allowance or professional staff, that was one of the options.⁵⁰³ The special requirements in Tokyo for the two yearly rental renewal costs have not been implemented, although the Review Panel acknowledges the accommodation benefits that the NPFC provides to its professional staff.
446. These apparent anomalies suggest that the Commission may at times take ad hoc decisions to address an immediate issue, but without taking into account the broader consequences of the decision. While this is not unusual, it would be preferable if a more principled approach were taken to the setting of salaries and allowances to ensure fair treatment of all staff.
447. The Review Panel identified issues with regard to meeting documents, meeting reports, intersessional communications and their inclusion on the NPFC website. Some of these issues relate to transparency, which is addressed in Chapter 7. The following section deals with the efficient use of the NPFC website.
448. At FAC02 in 2017, the NPFC Document Rules were developed and accepted by the Commission.⁵⁰⁴ These provide the following:
- The Secretariat will upload submitted documents to the Meetings page of the NPFC website which will be accessible for Members only. After the adoption of documents at the Annual Meeting, documents will be posted in the public area of the NPFC website. Documents determined to contain sensitive information shall remain on the Members' Area of the webpage.
449. The following year at COM04 the Commission requested the SC and the TCC to hold further discussions on the management of meeting documents, meeting reports and intersessional communications on the NPFC website, and requested the FAC to conduct an intersessional review of the rules of procedure on records and reports and present its recommendations to the next Commission meeting.⁵⁰⁵ These requests do not appear to have been taken up subsequently.
450. The importance of ensuring that the website contains relevant information, not only for Members but also for observers and the public, remains an issue. Although the Final Report of meetings are made available on the public side of the NPFC website, most meeting documents, even following conclusion of the meeting, are not available without a login. This also applies to intersessional decision-making. As a result of the pandemic there has been increasing use of intersessional decision-making. Although Members are advised of intersessional decisions, the decisions are not placed on the public section of the website or made available to observers. Nor are Circulars to

⁵⁰² FAC02 Final Report, para 11.

⁵⁰³ NPFC-2017-FAC01-WP04.

⁵⁰⁴ FAC01 Final Report, Annex K; COM03 Final Report, para 28.

⁵⁰⁵ COM04 Final Report, para 35.

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Members made available on the website. The lack of information on the website constrains participation by observers in the work of the NPFC and hampers the use of the website as a tool for public diplomacy.

8.2.1. Review Panel's findings

451. The Review Panel commends the NPFC for routinely receiving a clean audit report and considers that the NPFC efficiently and effectively manages the financial and human resources available to it. There are, however, a few issues that have been identified by the Review Panel. Financial reports of expenditures are not as expeditiously presented to Members as would normally be the case. The Secretariat would benefit from having a Corporate Plan which sets out the actions required, and identifies the resources available, to support the Commission. The Secretariat has hardworking staff who have adapted to additional duties required of them. The Review Panel invites the Commission to assign responsibility for 360 degree performance reviews for all staff to the Executive Secretary. There are also issues with making relevant information available to the public on the NPFC website.

8.2.2. Review Panel's recommendations

Recommendation 8.2.1: That the Commission task the Secretariat to develop a Corporate Plan to better inform the work of the NPFC Secretariat, to assist in ensuring financial and staff resources are appropriate in relation to expectations and to assist with the monitoring of the Secretariat's performance.

Recommendation 8.2.2: That the Commission review the NPFC Document Rules with a view to ensuring that the website contains all information on past meetings, including the documents submitted, on the outcomes of intersessional decision-making and all other relevant information for Members, observers and the public.

ANNEX 1: REVIEW CRITERIA

The purpose of the performance review is to evaluate the Commission’s performance against comprehensive criteria provided by the Commission and more generally against the objectives and principles set out in the Convention. The criteria presented in the table below are mostly those recommended by the tuna RFMOs meeting held in 2007 and are currently being used by most RFMOs. However, they may be modified by the Review Panel in accordance with the characteristics of NPFC. The Review Panel shall provide recommendations for the Commission on how to improve its performance with respect to the review criteria. The methodology for carrying out the review by the Review Panel in general consists of a set number of meetings among the Panel members, intersessional analyses of information through interviews, desk studies based on documents collected, and assignment of tasks for each panelist by the Chair. In addition, some consultations will be held in the margins of other regional or international meetings where panel members are present or readily available for a meeting. The review panel meetings will be guided by the Chair selected from amongst the members of the Panel and assisted by the Secretariat. The information used by the Panel come from various sources, but interviews with various stakeholders involved in the Commission’s activities are one of the basic steps to ensure the Panel can collect relevant information regarding the overall performance of the organization against its objectives and the principles of the Convention, international instruments and established best practices. The Panel develops a questionnaire based on the criteria, which is then addressed to all stakeholders, including Members, Cooperating non-Contracting Parties, and observers. The Panel then interviews the chairs of various committees on how the committees worked, resulting in the Panel’s suggestions for strengthening the organization. The Panel can meet stakeholders in person or via electronic means. Additional information can also be sought from the Commission’s website and directly from the Secretariat.

CRITERIA	GENERAL CRITERIA	DETAILED CRITERIA
CONSERVATION AND MANAGEMENT	Adoption of conservation and management measures	<ul style="list-style-type: none"> • Extent to which the NPFC has adopted measures for both target stocks and nontarget species that ensures long-term conservation and sustainable use of the fisheries resources based on the best scientific evidence available • Extent to which the NPFC has taken due account of the need to protecting biodiversity in the marine environment, including by preventing significant adverse impacts on vulnerable marine ecosystems, taking into account any relevant international standards or guidelines including the FAO International Guidelines (Art 3 (e)); • Extent to which the NPFC has adopted measures to minimizing pollution and waste originating from fishing vessels, discards, catch by lost or abandoned gear, and impacts on other species and marine ecosystems through measures including, to the extent practicable, the development and use of selective, environmentally safe, and cost-effective fishing gear and techniques (Art 3 (k)).

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		<ul style="list-style-type: none"> • Extent to which consistent/compatible management measures have been adopted as set out in Article 7 of the 1995 UN Fish Stocks Agreement (Art 3 (i)) and other pertinent international legislation adopted by the Commission and its Members. • Extent to which NPFC adopts measures and processes compatible with other RFMOs in the Pacific Ocean Basin, especially those with overlapping jurisdictions.
	Data collection and sharing	<ul style="list-style-type: none"> • Extent to which the NPFC has agreed formats, specifications and timeframes for data submission, taking into account UNFSA Annex I (Art 16.1). • Extent to which NPFC Members and CNCs, individually or through the NPFC, collect and share complete and accurate fisheries data concerning target stocks and non-target species and other relevant data in a timely manner (Art 16.1 (a)(b)).
		<ul style="list-style-type: none"> • Extent to which fishing data and fishing vessel data are gathered by the RFMO and shared among members and other RFMOs (Art 16.1. (c) (d)). • Extent to which the NPFC is addressing any gaps in the collection and sharing of data as required • Extent to which the NPFC has set security and confidentiality standards and rules for sharing of sensitive science and operational/compliance data (Art 16.4).
	Capacity management	<ul style="list-style-type: none"> • Extent to which the NPFC has taken actions to prevent or eliminate overfishing and excess fishing capacity, and ensuring that levels of fishing effort or harvest levels are based on the best scientific information available and do not exceed those commensurate with the sustainable use of the fisheries resources (Art 3 (f))
	Fishing allocations and opportunities	<ul style="list-style-type: none"> • Extent to which the NPFC agrees on the allocation of allowable catch or levels of fishing effort, including taking into account requests for participation from new Contracting Parties as reflected in UNFSA Article 11 (Art 7 (b), 7 (e), (f))
	Ecosystem approach to fisheries	<ul style="list-style-type: none"> • Extent to which the NPFC decisions take account of and incorporate an ecosystem approach to fisheries and precautionary approach (Art 2 (c))
COMPLIANCE AND ENFORCEMENT	Flag States duties	<ul style="list-style-type: none"> • Extent to which the NPFC Members are fulfilling their duties as Flag States under the Convention and other international instruments, including, inter alia, the 1982 Law of the Sea Convention, 1995 UN Fish Stocks Agreement and the 1993 FAO Compliance Agreement, as applicable (Art 13).

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	Port State measures	<ul style="list-style-type: none"> • Extent to which the NPFC has adopted measures relating to the exercise of the rights and duties of its members as port States, in accordance with international law, to promote the effective of subregional, regional, and global conservation and management measures (Art 14)
	Monitoring, control and surveillance (MCS)	<ul style="list-style-type: none"> • Extent to which the NPFC has adopted integrated MCS measures including vessel monitoring system (Article 7.2 (e), High Seas Boarding and Inspection Scheme (Article 17.6), Observer Program (Article 7.2 (b)), and Transshipment Verification and Regulation (Article 7.2 (a))), and other standards for verification of fisheries data (Article 10(1(d)), including the use of emerging MCS tools and technologies. • Extent to which these measures are effectively implemented.
	Follow-up on infringements	<ul style="list-style-type: none"> • Extent to which the NPFC, its Members and Cooperating Non-Contracting Parties follow up on infringements to conservation and management measures, and other decisions of the Commission, and report back to the Commission.
	Market-related measures	<ul style="list-style-type: none"> • Extent to which the NPFC has adopted non-discriminatory market-related measures consistent with international law to prevent, deter and eliminate IUU fishing (Art 7.2 (g))
	Cooperative mechanisms to detect and deter noncompliance	<ul style="list-style-type: none"> • Extent to which the NPFC has established adequate cooperative mechanisms to both monitor compliance and detect and deter non-compliance with RFMOs and the International Community (e.g., compliance committees, vessel lists, sharing of information about non-compliance)
SCIENCE	Status of living marine resources	<ul style="list-style-type: none"> • Status of North Pacific fish stocks under the purview of the NPFC in relation to the maximum sustainable yield (Art 3. (b)) • Trends in the abundance of those stocks • Status of species belonging to the same ecosystem or dependent upon or associated with the target species (Art 3 (d))
	Quality and provision of scientific advice	<ul style="list-style-type: none"> • Extent to which the NPFC provides and acts based on the best scientific advice relevant to the North Pacific living marine resources under its purview, as well as to the effects of fishing on the marine ecosystems in which these resources occur (Art 7.1, 10.1)
	Long-term planning and research	<ul style="list-style-type: none"> • Extent to which the NPFC adopts and regularly reviews a long-term strategy for the Scientific Committee to implement (Art 10.4).

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	Best available science	<ul style="list-style-type: none"> • Extent to which best available science is used by the Scientific Committee
DECISION MAKING AND DISPUTE SETTLEMENT	Decision-making	<ul style="list-style-type: none"> • Extent to which the NPFC has transparent and consistent decision-making procedures that facilitate the adoption of conservation and management measures in a timely and effective manner (Art 8)
	Dispute settlement	<ul style="list-style-type: none"> • Extent to which the NPFC has established adequate mechanisms for resolving disputes among Members (Art 19)
INTERNATIONAL COOPERATION	Relationship to cooperating non-Members	<ul style="list-style-type: none"> • Extent to which the NPFC facilitates cooperation between Members and non-Contracting Parties, including through requesting to become a Contracting Parties or to implement NPFC conservation and management measures.
	Relationship to non-cooperating non-Members	<ul style="list-style-type: none"> • Extent to which the NPFC takes measures consistent with this Convention and other relevant international legal instruments to deter the activities of fishing vessels of non-Contracting Parties to this Convention that undermine the effectiveness of conservation and management measures adopted by the Commission (Art 20.4).
	Cooperation with other international organizations	<ul style="list-style-type: none"> • Extent to which the NPFC cooperates with Regional Fisheries Management Organizations, United Nations bodies and other international organizations addressing fisheries and ecosystems such as PICES, FAO, and the network of Regional Fishery Body Secretariats. • Extent to which there is compatibility of procedures and processes with other relevant RFMOs, especially those in the Pacific Ocean Basin, and more specifically those with overlapping jurisdictions to facilitate management, exchange of information between organizations and enhance common standards for the involved industry fleets.
	Special requirements of Developing States	<ul style="list-style-type: none"> • Extent to which the NPFC recognizes the special needs of developing States and pursues forms of cooperation with developing States, including with respect to fishing allocations or opportunities, taking into account UNFSA Articles 24 and 25, and the Code of Conduct of Responsible Fisheries Article 5.
	Transparency	<ul style="list-style-type: none"> • Extent to which the NPFC is operating in a transparent manner, as reflected in UNFSA Article 12 and the Code of Conduct for Responsible Fisheries Article 7.1.9 (Art 18) • Extent to which the NPFC decisions, meeting reports, scientific advice upon which decisions are made, and other relevant materials are made publicly available in a timely fashion (Art 16.2).

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FINANCIAL AND ADMINISTRATIVE ISSUES	Availability of resources for NPFC activities	<ul style="list-style-type: none">• Extent to which financial and other resources are made available to achieve the aims of the NPFC and to implement the NPFC's decisions• Extent to which current finance and administrative practices meet international standards.
	Efficiency and cost effectiveness	<ul style="list-style-type: none">• Extent to which the NPFC is efficiently and effectively managing its human and financial resources, including those of the Secretariat.

ANNEX 2: Biographies of the Performance Review Panel

Penelope RIDINGS, PhD, International Lawyer and Honorary Professor (Chair)

She provides advice on international law, oceans and fisheries, and the environment and is currently Legal Advisor to the Western and Central Pacific Fisheries Commission and Member of the International Law Commission. Previously she was a lawyer and diplomat with the New Zealand Ministry of Foreign Affairs and Trade, including as the Ministry's chief International Legal Adviser. She has represented New Zealand in regional and multilateral negotiations, including WCPFC, FAO Port State Measures and marine biodiversity beyond national jurisdiction, and at regional fisheries management meetings, including WCPFC, SPRFMO and CCAMLR, bilateral legal and fisheries talks, and international dispute settlement. She was Chair of the First Performance Review of SPRFMO.

Huang-chih CHIANG, PhD, Professor of Law, College of Law, National Taiwan University

Completing his undergraduate studies in law at NTU and receiving his LL.M. at the University of Washington (Seattle), Professor Huang-Chih Chiang holds a Ph.D. in international law from the University of London (QMW). He specializes in public international law, international human rights law and the law of the sea. Professor Huang-Chih Chiang has published three books, *International Law and Taiwan*, *Introduction to Public International Law and Law of the Sea* (2 volumes), as well as numerous articles in esteemed Taiwanese legal journals. Professor Chiang has been serving as legal advisor of Taiwanese delegation to various international fisheries management organizations, including NPFC, CCSBT, WCPFC, SIOFA etc. He also engaged in numerous bilateral fisheries negotiations between Taiwan and other States.

Quentin HANICH, PhD, A/Professor, University of Wollongong

Quentin Hanich leads the Fisheries Governance Research Program at the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, where he is a Nippon Foundation Ocean Nexus Chair. A/Prof Hanich has worked widely throughout the Asia Pacific region in various international research partnerships focusing on ocean governance and emerging technologies, marine conservation, fisheries management, and international development. He has chaired international working groups at treaty meetings, facilitated inter-governmental workshops, and advised Ministerial meetings and national delegations. In addition to his roles at the University of Wollongong, A/Prof Hanich is the Editor-in-Chief of the highly ranked Elsevier journal *Marine Policy*, a Principal Investigator in the Nippon Foundation funded Ocean Nexus Program, a research partner with the Japanese Fisheries Research and Education Agency and Global Fishing Watch, and a research partner with the Korean Maritime Institute.

James IANELLI, PhD, NOAA

Jim's fishery experience began with fieldwork on tunas in the late 1970s for the Secretariat of the Pacific Community and the Inter-American Tropical Tuna Commission where he developed their lab based in Panama. He earned a PhD in 1993 from the University of Washington after various jobs and for the last 30+ years, he has been an active member of NOAA's Alaska Fisheries Science Center's stock assessment team. He serves as Chair of the Gulf of Alaska groundfish Plan Team for the North Pacific Fishery Management Council. His research interests include developing statistical approaches for ecosystem and fisheries conservation management. He is an affiliate

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professor at the University of Washington and the University of Maine and serves the Scientific Advisory Panel for the Commission for the Conservation of Southern Bluefin Tuna (since 1999). He continues to Chair the South Pacific Regional Fisheries Management Organization's Scientific Committee.

Joji MORISHITA, PhD, Professor, Tokyo University of Marine Science and Technology

He has been Involved in international oceans and fisheries issues since 1982 as a representative of the Government of Japan, covering bilateral fisheries access and trade negotiations with several countries, meetings of RFMO/As including CCAMLR, CCSBT, and NPFC, multilateral fisheries conferences including FAO COFI, APEC Fisheries WG, and also CBD, CITES, and UN General Assembly Informal Consultations on the sustainable fisheries resolution, the Meeting on High Seas Fisheries in the Central Arctic Ocean, IUCN Congress, and other international ocean and environmental meetings. He was Japan's Commissioner to the International Whaling Commission (IWC) from 2013 to 2018 and served as IWC's Chair from 2016 to 2018. He was also the Chair of the NPFC Scientific Committee from 2015 to 2019. He is currently Commissioner to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

Siquan Tian, PhD, Professor, Fisheries Sciences at Shanghai Ocean University

He has served as the Director of Science and Technology Division of Shanghai Ocean University. His research interests are focused on fisheries dynamics population, fisheries stock assessment, fisheries management and fisheries Oceanography. Particular interest is in conservation and management of international fisheries resources. He has been involved in the multilateral negotiations of NPFC fisheries as an adviser of China's government delegation and the head of China's delegation for SC meetings of NPFC since 2010. He had also attended the scientific meetings of other RFMOs which includes IOTC, SIOFA, ICCAT and SPRFMO.

Osvaldo URRUTIA, PhD, Lecturer and FAO Consultant

Dr Urrutia (PhD Victoria University of Wellington, LL.M University College London) is a national of Chile, a lecturer in international law and law of the sea at P. Universidad Católica de Valparaíso and a consultant for the Food and Agriculture Organization of the United Nations. As a legal adviser of the Government of Chile for nearly twenty years, Mr Urrutia was involved in international ocean and fisheries affairs and negotiations, including the work of several global and regional organisations. He served as the chairperson of the Commission of the South Pacific Regional Fisheries Management Organisation (SPRFMO) and as chair of the compliance committees in the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and SPRFMO.

Andrew Wright, Consultant

Andrew Wright has 30 years of experience in multilateral processes associated with marine resource conservation and management. His professional career includes substantial experience in tropical fisheries with a focus on large scale industrial fisheries for highly migratory tuna and billfish and artisanal and subsistence fisheries targeting coral reef-associated resources in the Western and Central Pacific. He has held senior executive posts in the Pacific Islands Forum Fisheries Agency based in Solomon Islands, was the inaugural Executive Director of the Western and Central Pacific Fisheries Commission based in Micronesia, and was the Executive Secretary at the Commission for the Conservation and Management of Antarctic Marine Living Resources (CCAMLR) between 2010 and 2018. Since he has been active as a freelance consultant.



North Pacific Fisheries Commission

Annex H:SC06 Report

NPFC-2021-SC06-Final Report



**6th Scientific Committee Meeting
REPORT**

15-18 December 2021

January 2022

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**North Pacific Fisheries Commission
6th Meeting of the Scientific Committee**

15-18 December 2021

WebEx

REPORT

Agenda Item 1. Opening of the Meeting

1. The 6th Meeting of the Scientific Committee (SC) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America and Vanuatu. The European Union (EU), the United Nations Food and Agriculture Organization (FAO), the North Pacific Anadromous Fish Commission (NPAFC), the North Pacific Marine Science Organization (PICES) and the Pew Charitable Trusts (Pew) attended as observers. The meeting was opened by Dr. Janelle Curtis (Canada), who served as the SC Chair.
2. The Executive Secretary, Dr. Dae Yeon Moon, welcomed the participants to the meeting, expressing his regret that, due to the ongoing COVID-19 pandemic, this year's meeting of the SC has had to be held virtually again. He pointed out that the Commission's work should be based on the best science available to ensure the long-term conservation and sustainable use of marine resources and the protection of marine ecosystems in the Convention Area and that the SC's contributions will help to better inform the Commission's Conservation and Management Measures (CMMs). The Executive Secretary thanked the SC for its hard work over the past six years and noted that this work continues to grow in importance each year and now includes a management strategy evaluation for Pacific saury and the first performance review of the Commission.
3. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

4. The SC agreed to hear an update from the EU on its chub mackerel fisheries operation plan and impact assessment under Agenda Item 10.4 Other issues.
5. The agenda was adopted without revision (Annex A). The List of Documents and List of

Participants are attached (Annexes B, C).

Agenda Item 3. Meeting arrangements

6. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

Agenda Item 4. Review of reports and recommendations from the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) and the Small Scientific Committees (SSC BF-ME and SSC PS)

4.1 Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

7. The TWG CMSA Chair, Dr. Vladimir Kulik (Russia), summarized the outcomes and recommendations of the 4th TWG CMSA meeting (NPFC-2021-TWG CMSA04-Final Report).
8. The SC reviewed the recommendations of the TWG CMSA and endorsed the following recommendations:
 - (a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2021-TWG CMSA04-WP12 (Rev. 1)).
 - (b) The TWG CMSA recommended hiring an external expert to continue the work to develop an operating model (PopSim) and test chub mackerel stock assessment models, if needed, in the next year.
 - (c) The TWG CMSA recommended holding two meetings in 2022, possibly in spring and fall, with the specific dates and meeting format to be determined intersessionally via correspondence.
9. The SC noted that the TWG CMSA intends to conduct a preliminary stock assessment for chub mackerel in 2022 and a complete stock assessment in 2023.

4.2 SSC on Bottom Fish and Marine Ecosystems

10. The Chair of the SSC on Bottom Fish and Marine Ecosystems (SSC BF-ME), Dr. Chris Rooper (Canada), summarized the outcomes and recommendations of the 2nd SSC BF-ME meeting (NPFC-2021-SSC BFME02-Final Report).
11. The SC reviewed the recommendations of the SSC BF-ME and endorsed the following recommendations:
 - (a) Adopt the species summaries of North Pacific armorhead (Annex D), splendid alfonsino (Annex E), sablefish (Annex F), and blackspotted and rougheye rockfishes (Annex G).
 - (b) Adopt the Terms of Reference for stock assessment for North Pacific armorhead and splendid alfonsino.

- (c) Endorse the updated 2021-2025 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2021-SSC BFME02-WP03 (Rev. 1))
- (d) Endorse the revised CMM 2021-05 (Annex L).
- (e) Endorse the revised CMM 2019-06 (Annex M).
- (f) Select Dr. Chris Rooper (Canada) to serve as Chair and Dr. Felipe Carvalho (USA) to serve as vice-Chair of the SSC BF-ME.
- (g) Select Dr. Kota Sawada (Japan) to serve as the new SWG NPA-SA Lead.
- (h) Recommend that the Commission co-sponsor the PICES WG-47 Workshop on “Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions” by contributing the equivalent of \$5,000 USD.

4.3 SSC on Pacific Saury

- 12. The Chair of the SSC on Pacific Saury (SSC PS), Dr. Toshihide Kitakado (Japan), summarized the outcomes and recommendations of the 7th and 8th SSC PS meetings (NPFC-2021-SSC PS07-Final Report, NPFC-2021-SSC PS08-Final Report).
- 13. The SC reviewed the recommendations of the SSC PS and endorsed the following recommendations:
 - (a) Endorse the stock assessment report (Annex N).
 - (b) Endorse the SSC PS Work Plan (NPFC-2021-SSC PS08-WP04).
 - (c) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
 - (d) Select Dr. Toshihide Kitakado (Japan) to serve as Chair of the SSC PS.
 - (e) Hold two 4-day formal meetings (30 August to 2 September and November or December), and intersessional meetings of the SSC PS in 2022.
 - (f) Consider and endorse the rationale and approach in its scientific advice to the Commission described in paragraph 37 of the SSC PS08 meeting report, i.e.:
 - i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach ($B_{2021} * F_{MSY} = 192,804$ tons) and the current biomass is much lower than B_{MSY} . Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).
 - ii. A harvest control rule (HCR) that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

14. The SC noted that Vanuatu is a small island developing state which is still developing its fishery, and that Vanuatu urges the SC to consider its aspirations to rebuild its fleet to 16 fishing vessels and increase catches accordingly when making recommendations to the Commission in the future.
15. The SC endorsed the reports provided by the TWG CMSA, the SSC BF-ME, and the SSC PS.

Agenda Item 5. Priority species

5.1 Summary of progress on the remaining four priority species

16. The SC discussed long-term work towards conducting stock assessments for Japanese flying squid (JFS), neon flying squid (NFS), spotted mackerel (SM), and Japanese sardine (JS), and agreed that it would be helpful for each Small Working Group (SWG) to summarize any potential challenges to conducting a stock assessment for its assigned species.

5.1.1 Neon flying squid

17. The SWG NFS Lead, Dr. Luoliang Xu, reported on the SWG NFS' intersessional activities. The SWG NFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for exchanging information, reviewed fisheries and fishing history of NFS, reviewed the outcomes of Japan's NFS research survey, reviewed Members' available NFS data, and developed a species summary document for NFS.
18. The SC discussed future tasks for the SWG NFS and agreed on the following:
 - (a) Update the NFS species summary document
 - (b) Develop a data template and share data for NFS
 - (c) Compile NFS CPUE data and agree on CPUE indices
 - (d) Continue research on the spatial structure of the NFS stock
 - (e) Evaluate the spatial structure of NFS life history and stocks relative to fisheries
 - (f) Evaluate the influence of environmental variables on the life history and biology of NFS
 - (g) Review Members' approaches to stock assessments of NFS
 - (h) Discuss potential strategies for effectively managing NFS
 - (i) Summarize any potential challenges to conducting a stock assessment for NFS
19. The SC noted that NFS has a complicated life-history and biology. It is a short-lived species, is likely susceptible to fluctuations in biomass subject to environmental conditions, is highly migratory, has separate areas of reproduction and feeding, and has seasonal cohorts. Better understanding of the stock structure will be particularly important.

5.1.2 Japanese flying squid

20. The SWG JFS Lead, Dr. Kazuhiro Oshima, reported on the SWG JFS' intersessional activities. The SWG JFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for exchanging information, reviewed fisheries and fishing history of JFS, and developed a species summary document for JFS.
21. The SC discussed future tasks for the SWG JFS and agreed on the following:
- (a) Update the JFS species summary document
 - (b) Update and review Members' JFS catch and effort data
 - (c) Compile JFS CPUE data and agree on CPUE indices
 - (d) Continue research on the spatial structure of the JFS life history and stock relative to the fishing footprint
 - (e) Continue long-term research on the influence of environmental variables on the life history and biology of JFS
 - (f) Review Members' approaches to stock assessments of JFS and the results of Japan's domestic stock assessment
 - (g) Summarize any potential challenges to conducting a stock assessment for JFS

5.1.3 Japanese sardine

22. The SWG JS Lead, Dr. Chris Rooper, reported on the intersessional activities of the SWG JS. The SWG JS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for exchanging information, conducted a review of Members' fisheries, reviewed Members' available data, and developed a species summary document for JS.
23. The SC discussed future tasks for the SWG JS and agreed on the following:
- (a) Update the JS species summary document
 - (b) Develop a data template and share data for JS
 - (c) Compile JS CPUE data and agree on CPUE indices
 - (d) Continue research on the spatial structure of the JS life history and stocks relative to the fishing footprint
 - (e) Evaluate the influence of environmental variables on the life history and biology of JS
 - (f) Review Members' approaches to stock assessments of JS and the results of Japan's domestic stock assessment
 - (g) Summarize any potential challenges to conducting a stock assessment for JS

5.1.4 Spotted mackerel

24. The SWG SM Lead, Dr. Shota Nishijima, reported on the SWG SM's intersessional activities. The SWG SM has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for sharing information, reviewed fisheries and fishing history of SM, reviewed Members' available SM data, developed a species summary document for SM, discussed the need to correctly identify chub mackerel and SM given that combined data for both species are submitted to NPFC, and discussed which common name to use for SM given that the FAO species database lists "blue mackerel" rather than "spotted mackerel" as the common name for this species.
25. The SWG SM Lead explained that the SWG SM recommends that the common name "blue mackerel" be used for *Scomber australasicus* going forward. The SC endorsed the recommendation and agreed to change the name of the SWG to the SWG on blue mackerel (SWG BM).
26. The SC discussed future tasks for the SWG BM and agreed on the following:
 - (a) Update the BM species summary document
 - (b) Review the results of Japan's domestic stock assessment of BM
 - (c) Summarize any potential challenges to conducting a stock assessment for BM
 - (d) Share information and papers on species identification of BM and chub mackerel
 - (e) Continue data collation for BM

5.2 Development of summary sheets for all priority species

27. The SWG NFS Lead presented the species summary document for NFS (NPFC-2021-SC06-WP09 (Rev. 1)). The SC reviewed, revised and adopted the species summary document (Annex H).
28. The SWG JS Lead presented the species summary document for JS (NPFC-2021-SC06-WP03). The SC reviewed, revised and adopted the species summary document (Annex I).
29. Members offered suggestions for how to update the species summary document for JS in the intersessional period.
30. The SWG JFS Lead presented the species summary document for JFS (NPFC-2021-SC06-WP08). The SC reviewed, revised and adopted the species summary document (Annex J).
31. Members offered suggestions for how to update the species summary document for JFS in the intersessional period.

32. The SWG BM Lead presented the species summary document for BM (NPFC-2021-SC06-WP07 (Rev. 1)). The SC reviewed, revised and adopted the species summary document (Annex K).
33. Members offered suggestions for how to update the species summary document for BM in the intersessional period.

5.3 Identification of data needs and data gaps and strategies to fill those gaps

34. The SC tasked the SWGs for JFS, NFS, JS and BM with working to identify data needs and data gaps, and strategies to fill those gaps.

Agenda Item 6. Progress in data collection, management and security

6.1 Information management and security regulations

35. The Science Manager provided an update on the ongoing work to develop an overarching policy for data use and management that pertains to the SC and the Technical and Compliance Committee (TCC).

6.1.1 Procedures for sharing code

36. The SC reviewed the Regulations for Management of Scientific Data and Information and discussed the development of procedures for sharing code. The SC agreed that it would be useful for the Secretariat to establish an NPFC Github page for the sharing of code. The Chair agreed to draft additional text for the Regulations for Management of Scientific Data and Information on how to share code if Members choose to do so, with assistance from Canada. The text would be submitted to SC07 for discussion, revision and endorsement.

6.2 Data collection

6.2.1 Information about species belonging to the same ecosystem or dependent/associated with target stocks

6.2.2 Data gaps and needs that could be filled by an observer program

6.2.3 Scientific need for electronic monitoring

37. The SC agreed that collecting information on non-targeted species is important for facilitating the work and research of the SC. The SC agreed that the establishment of an observer program in the NPFC Convention Area would facilitate the collection of more data for such non-targeted species, as well as for NPFC priority species. The SC noted that each fishery has its own data needs, data gaps and logistical matters and would require its own observer program. The SC agreed to task its subsidiary bodies including the SWGs with identifying data needs and data

gaps for non-target species and priority species. Specifically, the SC tasked the subsidiary bodies with reporting the data needs and outlining methods (e.g. human or electronic observers) that could be used to collect the necessary data at SC07. The SC noted there remain some issues with electronic monitoring, including data storage, that require further discussion.

6.3 NPFC data management system (DMS)

38. The Data Coordinator, Mr. Sungkuk Kang, reported on the progress in the development of the SC-related data management system (NPFC-2021-SC06-IP03). Updates have been made to the Members Home, Significant dates/Events, Pacific Saury Weekly Report, Collaboration, and Annual reports sections. The NPFC GIS Map has recently been updated to include Pacific saury catch and effort data with sea surface temperature per grid from 1994 to 2020. At the request of the SSC BF-ME, the Secretariat has developed provisional maps of combined, gear-specific footprints by different gear types and time periods. These maps will be available in the Members' Area of the NPFC website soon.

Agenda Item 7. Scientific projects for 2022 and 2023

7.1 Ongoing/planned projects

7.2 New projects

7.3 Review and prioritization of projects

39. The Science Manager presented a draft list of scientific projects that were discussed during the meetings of the SC and its subsidiary bodies.

40. The SC reviewed the list of proposed scientific projects and endorsed it for consideration by the Commission (Annex O).

Agenda Item 8. Cooperation with other organizations

41. The Science Manager presented a compiled list of cooperation opportunities and requests from other organizations, for consideration by the SC (NPFC-2021-SC06-IP02 (Rev. 1)).

8.1 Reports on the joint NPFC-PICES activities since the SC05 meeting, including a report from PICES Secretariat

42. The Executive Secretary of PICES, Dr. Sonia Batten, reported on recent and upcoming PICES activities of relevance to the NPFC:

- (a) NPFC and PICES representatives participated in each other's annual meetings.
- (b) The NPFC has representation in the PICES-ICES joint Working Group on Small Pelagic Fish (WG43).
- (c) The NPFC is co-sponsoring the PICES-ICES-FAO Small Pelagic Fish Symposium.

- (d) The PICES Fishery Science Committee and the NPFC proposed a topic session for PICES-2022.
- (e) WG47 proposed a 2-day workshop for PICES-2022 on “Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions.”
- (f) PICES and NPFC will hold a joint international course/workshop on VME indicator taxa identification in 2022 with financial contributions of \$15,000 USD from each organization.
- (g) The ICES-PICES Sustainability of Marine Ecosystems Through Knowledge Networks (SMARTNET) program was endorsed by Intergovernmental Oceanographic Commission in June 2021 as a UN Decade of Ocean Sciences program.

8.2 Joint PICES-ICES WGSPF, PICES topic session on small pelagic fish (SPF) and PICES-ICES SPF symposium

- 43. Dr. Chris Rooper provided an overview of the PICES topic session on “Environmental variability and small pelagic fishes in the North Pacific: Exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management” to be held in autumn 2022.
- 44. Dr. Chris Rooper provided an update on the activities of the Joint PICES-ICES WGSPF, including plans to organize joint PICES-ICES-FAO SPF symposia at regular intervals, with the first to be held in Lisbon, Portugal in November 2022.

8.3 Joint NPFC-PICES workshop/course on VME indicator identification

- 45. The Science Manager reminded the SC that the SSC BF-ME agreed to postpone the VME indicator taxa identification course and that the SC endorsed this decision when it endorsed the SSC BF-ME02 meeting report.

8.4 SC representation at PICES meetings

- 46. The SC agreed that Members will provide nominations on or before 15 April 2022 for NPFC representatives to the PICES Annual Meeting in September/October 2022 and the PICES-ICES-FAO International Symposium on Small Pelagic Fishes in November 2022. Nominations should specify the meeting in question, the name of the proposed participant, and one or two sentences about how the participant meets each of the six criteria endorsed by the SC (part of a member’s delegation to NPFC, anticipated contributions, expertise, financial need, early career scientist, and willingness to report back to the SC on key meeting outcomes of interest to the NPFC). The SC Chair will work with Chairs of the SC’s subsidiary bodies to select one

SC representative to the former meeting and three SC representatives to the latter.

47. The SC recommends that the Commission financially support the travel of one member of the SC or its subsidiary bodies to participate in the PICES Annual Meeting, if financial support is necessary, and three members of the SC or its subsidiary bodies to participate in the PICES-ICES-FAO International Symposium on Small Pelagic Fishes in November 2022, if financial support is necessary.

8.5 NPFC/NPAFC Memorandum of Cooperation and Work Plan

8.5.1 NPFC's participation in the NPAFC's multinational IYS survey in the North Pacific Ocean

48. The Science Manager presented an update on NPFC's participation in the NPAFC's multinational IYS survey in the North Pacific Ocean (NPFC-2021-SC06-IP01 (Rev. 1)). He reminded the SC of the suggestions that the NPFC has made to the NPAFC and that following have been included in the research survey program:

- (a) Encouragement to cover all stations within the agreed survey area, in particular in its southern part, even if there will be no salmon catch on those stations, to catch more species of NPFC interest.
- (b) For non-salmon species, ensure all of them are identified, counted and weighed.
- (c) Conduct additional analyses of the NPFC priority species: Mandatory information – length, weight, sex, stomach content. Optional information/samples (if possible) – maturity stage, fish scale, otolith (or fish heads for otolith analyses)).
- (d) Encouragement to share raw data on priority species with the NPFC.

8.5.2 Review of the five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

49. The Executive Director of the NPAFC, Dr. Vladimir Radchenko, provided an update on the activities of the NPAFC and outlined the draft five-year Work plan to implement NPAFC/NPFC Memorandum of Cooperation, 2021-2025 (NPFC-2021-SC06-OP02) for consideration by the SC.

50. The SC reviewed and revised the SC-related items in the work plan (Annex P).

8.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)

51. Mr. Aureliano Gentile (FAO) presented a summary of the latest exchanges between the NPFC and the FIRMS Secretariat, an overview of FIRMS, and a draft stocks and fisheries inventory for the NPFC (NPFC-2021-SC06-OP03). FAO invited the SC to once again consider whether the NPFC should enter into an arrangement with FIRMS, and whether that should be a Partnership Arrangement or a Collaborative Arrangement.

52. The SC supported the NPFC entering into an arrangement with FIRMS. The SC recommends that the Commission consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

8.7 FAO ABNJ Deep-sea fisheries project

53. Dr. William Emerson (FAO) presented an update on the key activities and next steps of the ABNJ Deep Sea Fisheries (DSF) Project (NPFC-2021-SC06-OP04). The FAO ABNJ DSF project has been developed in partnership with RFMOs, ICES and industry. The Concept Note was approved on 2 June 2020, and the full project document submitted to the Global Environment Facility (GEF) on 25 November 2021. Currently 6 of 7 deep-sea RFMOs (including NPFC), ICES, NOAA, and two industry groups have formally submitted co-financing partnership letters to join the project. The 5-year project is expected to start in mid-2022. FAO thanked the NPFC for its support and looks forward to working with the NPFC and the other partners to ensure successful and sustainable DSF.
54. The Executive Secretary reiterated the NPFC's commitment to supporting and collaborating with the DSF Project in its second phase.

8.8 FAO-GFW collaboration on AIS

55. The Science Manager reminded the SC that it recommended that the NPFC collaborate with FAO and Global Fishing Watch (GFW) on the use of AIS data for scientific analyses at SC05. He informed the SC that the FAO has requested the NPFC to develop a proposal for such collaboration.
56. The SC encouraged Members to consider ways to collaborate with FAO and GFW on the use of AIS data for scientific analyses and agreed to revisit this matter at its next meeting.

8.9 Cooperation with other organizations

57. In response to a question from Pew regarding collaboration between the NPFC and WCPFC, the Executive Secretary explained that the two RFMOs have been working on establishing a Memorandum of Understanding for the sharing of information, but this process has been delayed due to the ongoing pandemic.

Agenda Item 9. 2021-2025 Research Plan and Work Plan

9.1 Five-year Research Plan

9.2 Five-year Work Plan

58. The SC reviewed its 2021-2025 Five-Year Rolling Research Plan (NPFC-2021-SC06-WP01) and Work Plan (NPFC-2021-SC06-WP02 (Rev. 1)). The Research Plan and the Work Plan of the SC and its subsidiary bodies are attached as Annex Q.

Agenda Item 10. Other matters

10.1 Review of the Scientific Committee Terms of Reference (TOR)

59. The SC reviewed its TOR and determined that no changes are currently needed.

10.2 Selection of SC Chair and vice-Chair

60. The SC selected Dr. Janelle Curtis (Canada) to continue to serve as the SC Chair and Dr. Jie Cao (China) to continue to serve as the SC vice-Chair.

10.3 Coordination between SC and TCC

61. The Science Manager updated participants on the TCC SWG Ops discussions on effort indicators in the CMMs for priority species. Members discussed the current effort indicators and had no revisions.
62. Based on the discussion above, the SC identifies the following as matters for coordination between the SC and the TCC:
- (a) Revision of CMMs 2021-05 and 2019-06 (Annexes L and M)
 - (b) Draft Work plan to implement NPAFC/NPFC Memorandum of Cooperation (Annex P)
 - (c) Effort indicators in the CMMs for priority species (paragraph 61)

10.4 Other issues

63. The EU provided an updated fisheries operation plan, including the most recent Japanese stock assessment. The EU presented an impact assessment for a chub mackerel fishery within the NPFC Convention Area, the fishing area, target species, fishing method, quantity, data collection and a risk-based assessment for the proposed fisheries (NPFC-2021-SC06-OP01).
64. Japan suggested that catch information for target and non-target species from similar fisheries operated by the EU in areas under the jurisdiction of other RFMOs be included in the EU's paper to the next SC meeting.
65. The SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

Agenda Item 11. Advice and recommendations to the Commission

66. Based on the recommendations from its SSCs and TWG CMSA, the SC recommends that the Commission:

- (a) Endorse the revised Research Plan and Work Plan (Annex Q).
- (b) Endorse the proposed scientific projects (Annex O).
- (c) Consider species summary documents as reference information when taking decisions on the management of the NPFC priority species (Annexes D-K).
- (d) Consider the scientific meetings schedule for 2022 as described in paragraph 68.
- (e) Consider holding an informal web meeting of the SWG MSE PS in 2022 to review the outcomes of the SSC PS09 meeting.

Chub Mackerel

- (f) Hire an external expert to continue the work to develop an operating model (PopSim) and test chub mackerel stock assessment models, if needed, in the next year.

Bottom Fish and Marine Ecosystems

- (g) Endorse the revised CMM 2021-05 (Annex L).
- (h) Endorse the revised CMM 2019-06 (Annex M).
- (i) Co-sponsor the PICES WG-47 Workshop on “Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions” by contributing the equivalent of \$5,000 USD.

Pacific Saury

- (j) Endorse the stock assessment report (Annex N).
- (k) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
- (l) Consider the following to improve conservation and management of Pacific saury:
 - i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach ($B_{2021} * F_{MSY} = 192,804$ tons) and the current biomass is much lower than B_{MSY} . Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).
 - ii. A harvest control rule (HCR) that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

Data Sharing

- (m) Update the data shared by TWG CMSA, SSC BF-ME and SSC PS in accordance with their Work Plans.

Cooperation with Other Organizations

- (n) Financially support the travel of one member of the SC or its subsidiary bodies to participate in the PICES-2022 Annual Meeting, if necessary.

- (o) Financially support the travel of three members of the SC or its subsidiary bodies to participate in the PICES-ICES-FAO International Symposium on Small Pelagic Fishes in November 2022, if necessary.
- (p) Endorse the revised science-related items of the five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (Annex P).
- (q) Consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

67. In relation to other tasks for the SC specified in CMMs and the Convention, the SC informs the Commission of the following:

Chub Mackerel

- (a) The TWG CMSA will conduct a preliminary stock assessment for chub mackerel in 2022.
- (b) The TWG CMSA may hold informal web meetings to check progress and plan intersessional work.

Bottom Fish and Marine Ecosystems

- (c) The SSC BF-ME will update the species summaries of North Pacific armorhead, splendid alfonsino, sablefish, and blackspotted and rougheye rockfishes.
- (d) The SC adopted the Terms of Reference for stock assessment for North Pacific armorhead and splendid alfonsino ([available on the website](#)).
- (e) The SSC BF-ME selected Dr. Chris Rooper (Canada) to serve as Chair and Dr. Felipe Carvalho (USA) to serve as vice-Chair of the SSC BF-ME.
- (f) The SSC BF-ME selected Dr. Kota Sawada (Japan) to serve as the new SWG NPA-SA Lead.
- (g) The SSC BF-ME will hold informal web meetings of the SWG NPA-SA and SWG VME to check their progress and plan intersessional work.

Pacific Saury

- (h) The SSC PS selected Dr. Toshihide Kitakado (Japan) to serve as Chair of the SSC PS.
- (i) The SSC PS will hold informal web meetings to check progress and plan intersessional work.

Other priority species

- (j) The SC agreed that the common name “blue mackerel” be used instead of “spotted mackerel” for *Scomber australasicus* and that the SWG SM will henceforth be known as the SWG BM.
- (k) The SC will update the species summaries of NFS, JFS, JS and BM.

Observer Program

- (l) The SC will continue discussions on the establishment of an observer program in the

NPFC Convention Area, including identifying data needs and data gaps for non-target species and priority species. Specifically, the SC tasked the subsidiary bodies with reporting the data needs and outlining methods (e.g. human or electronic observers) that could be used to collect the necessary data at SC07.

SC Chair and Vice Chair

- (m) The SC selected Dr. Janelle Curtis (Canada) to continue to serve as the SC Chair and Dr. Jie Cao (China) to continue to serve as the SC vice-Chair.

Cooperation with Other Organizations

- (n) The SC endorsed the suggestions to the research survey program of the NPAFC/IYS 2022 pan-Pacific winter high seas expedition (paragraph 48).

EU Fisheries Operation Plan

- (o) Without a stock assessment of chub mackerel in the Convention Area, the SC noted it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

Agenda Item 12. Next meeting

68. The SC suggested the following meeting schedule for 2022:

- (a) TWG CMSA05: 16-19 May
- (b) SSC PS09: 30 August to 2 September
- (c) TWG CMSA06: 5-8 September
- (d) SSC BF-ME03: 8-10 December
- (e) SSC PS10: 12-15 December
- (f) SC07: 16-17 and 19-20 December

69. With regard to the meetings tentatively scheduled for December, the SC agreed that the abovementioned schedule would be preferable if the meetings are to be held in person. If the meetings are to be held virtually, the SC agreed to revisit the schedule in the intersessional period and seek to adjust it as appropriate.

Agenda Item 13. Press release

70. The SC endorsed the press release for the publication on the NPFC website after the meeting.

Agenda Item 14. Adoption of the Report

71. The SC06 Report was adopted by consensus.

Agenda Item 15. Close of the Meeting

72. The meeting closed at 10:39 on 18 December 2021, Tokyo time.

Annexes:

Annex A – Agenda

Annex B – List of documents

Annex C – List of participants

Annex D – Species summary for North Pacific armorhead

Annex E – Species summary for splendid alfonsino

Annex F – Species summary for sablefish

Annex G – Species summary for blackspotted and rougheye rockfishes

Annex H – Species summary for neon flying squid

Annex I – Species summary for Japanese sardine

Annex J – Species summary for Japanese flying squid

Annex K – Species summary for blue mackerel

Annex L – Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean

Annex M – Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean

Annex N – Stock Assessment Report for Pacific Saury

Annex O – Scientific projects

Annex P – Five-year Work Plan (2021–2025) to implement NPAFC/NPFC Memorandum of Cooperation

Annex Q – Five-Year Research Plan and Work Plan of the Scientific Committee

Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Meeting arrangements

Agenda Item 4. Review of reports and recommendations from the Small Scientific Committees (SSC BF-ME and SSC PS) and the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

4.1 Technical Working Group on Chub Mackerel Stock Assessment

4.2 SSC on Bottom Fish and Marine Ecosystems

4.3 SSC on Pacific Saury

Agenda Item 5. Priority species

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5.1.1 Neon flying squid

5.1.2 Japanese flying squid

5.1.3 Japanese sardine

5.1.4 Spotted mackerel

5.2 Development of summary sheets for all priority species

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6.1.1 Procedures for sharing code

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8.5.2 Review of the five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

8.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)

8.7 FAO ABNJ Deep-sea fisheries project

8.8 FAO-GFW collaboration on AIS

8.9 Cooperation with other organizations

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9.2 Five-year Work Plan

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10.2 Selection of SC Chair and vice-Chair

10.3 Coordination between SC and TCC

10.4 Other issues

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Agenda Item 12. Next meeting

Agenda Item 13. Press release

Agenda Item 14. Adoption of the Report

Agenda Item 15. Close of the Meeting

List of documents

MEETING INFORMATION PAPERS

Document Number	Title
NPFC-2021-SC06-MIP01	Meetings Information
NPFC-2021-SC06-MIP02	Provisional Agenda
NPFC-2021-SC06-MIP03 (Rev. 2)	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Document Number	Title
	Terms of References of the SC

WORKING PAPERS

Document Number	Title
NPFC-2021-SC06-WP01	NPFC SC 2021-2025 Research Plan
NPFC-2021-SC06-WP02 (Rev. 1)	Five-Year Work Plan of the Scientific Committee
NPFC-2021-SC06-WP03	Japanese Sardine Species Summary
NPFC-2021-SC06-WP04	Scientific Projects
NPFC-2021-SC06-WP05	Summary of the 1st meeting of the Small Working Groups on JFS, NFS, SM, and JS
NPFC-2021-SC06-WP06	Summary of the 2nd meeting of the Small Working Groups on JFS, NFS, SM, and JS
NPFC-2021-SC06-WP07 (Rev. 1)	Blue Mackerel Species Summary
NPFC-2021-SC06-WP08	Japanese Flying Squid Species Summary
NPFC-2021-SC06-WP09 (Rev. 1)	Neon Flying Squid Species Summary

INFORMATION PAPERS

Document Number	Title
NPFC-2021-SC06-IP01 (Rev. 1)	NPFC's participation in the NPAFC's multinational IYS survey in the North Pacific Ocean
NPFC-2021-SC06-IP02 (Rev. 1)	A compiled list of cooperation opportunities and requests from other organizations
NPFC-2021-SC06-IP03	NPFC Data Management System

OBSERVER PAPERS

Document Number	Title
NPFC-2021-SC06-OP01	Fisheries Operation Plan and impact assessment for chub mackerel fishery within the NPFC Convention area
NPFC-2021-SC06-OP02	Five-year Work Plan (2021–2025) to Implement NPAFC/NPFC Memorandum of Cooperation
NPFC-2021-SC06-OP03	Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)
NPFC-2021-SC06-OP04	ABNJ Deep Sea Fisheries Project

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Species summary for North Pacific armorhead

North Pacific armorhead (*Pentaceros wheeleri*)

Common names: Pelagic armorhead, Slender armorhead (English); 五棘鯛 (Chinese); クサカリツボダイ (Japanese); 북방돓돓 (Korean); кабан-рыба (Russian)

Biological Information

North Pacific armorhead has a unique life history consisting of a pelagic larva phase and a demersal adult stage on the seamounts (Kiyota et al. 2016). Distribution of the larva includes Gulf of Alaska to North Pacific Ocean off central California and south of Japan, with center of abundance at the Emperor Seamounts. Following their settlements in the seamounts, adults make morphological changes from the “fat” type to the “lean” type concurrent with their dietary shifts. Vertical distribution of the adults ranges from 300-500 m. Juveniles at the epipelagic stage mainly feeds on copepods, shifting the targets towards fish and large crustaceans with growth.

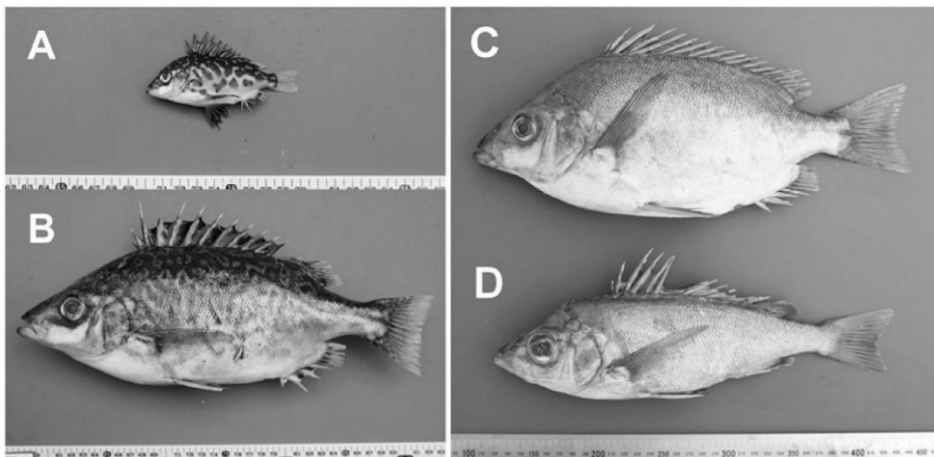


Figure 1: Photographs of North Pacific armorhead. A) Pelagic juvenile, B) pelagic subadult, C) demersal adult (fat type), D) demersal adult (lean type) (from Kiyota et al. 2016)

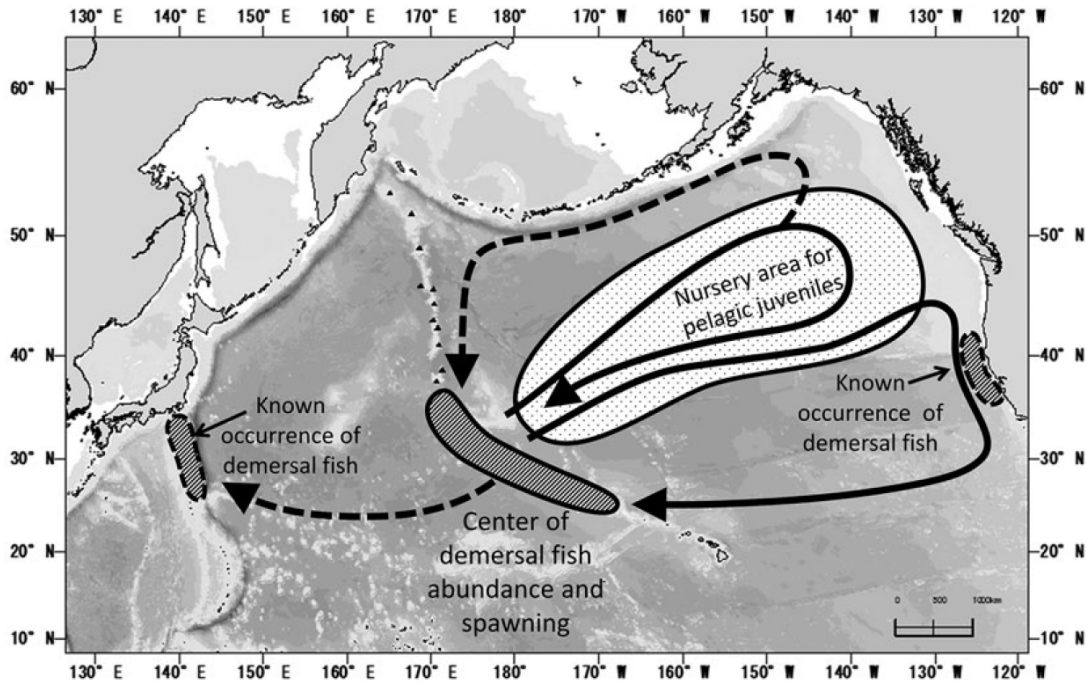


Figure 2: Known demersal habitats and hypothesized pelagic migration routes of North Pacific armorhead (Kiyota et al. 2016 Figure 4, modified from Boehlert and Sasaki 1988).

Fishery

Historical catches by Russia and Japan from the combined Emperor Seamounts were high and reached 100 thousand tons in 1970s, followed by a crash (Figure 3). Currently North Pacific armorhead is caught by Japan and Korea on the Emperor Seamounts using bottom trawls and gillnets. This fishery is a potential source of significant adverse impacts on vulnerable marine ecosystems due to bottom contact gear.

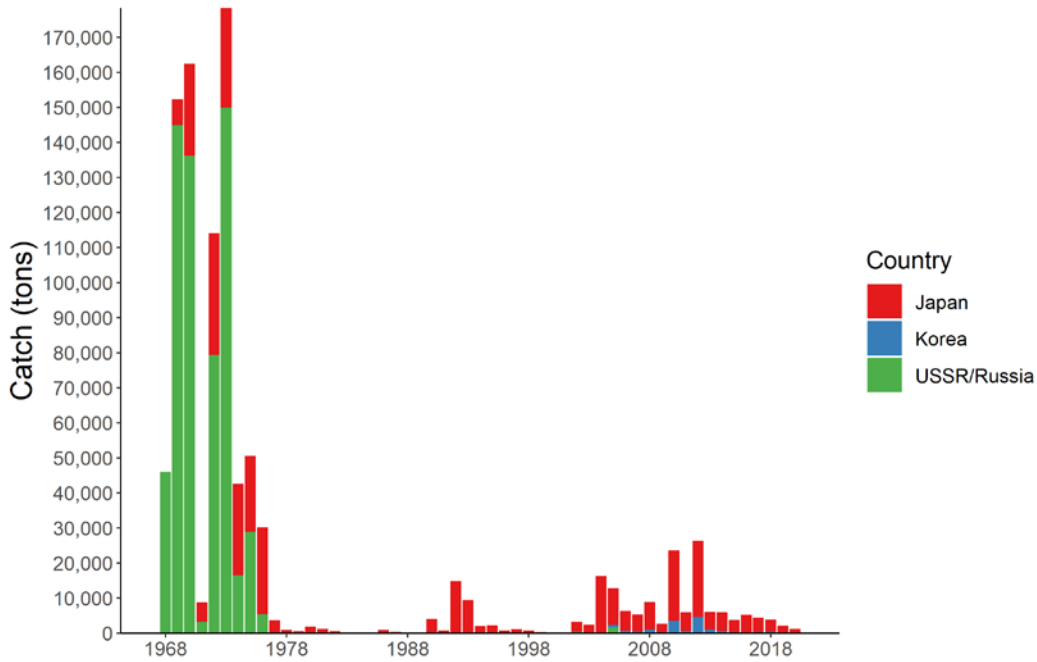


Figure 3: Historical trends of North Pacific armorhead catches in NPFC waters. The annual amounts of catch by each country are shown by the bar plot.

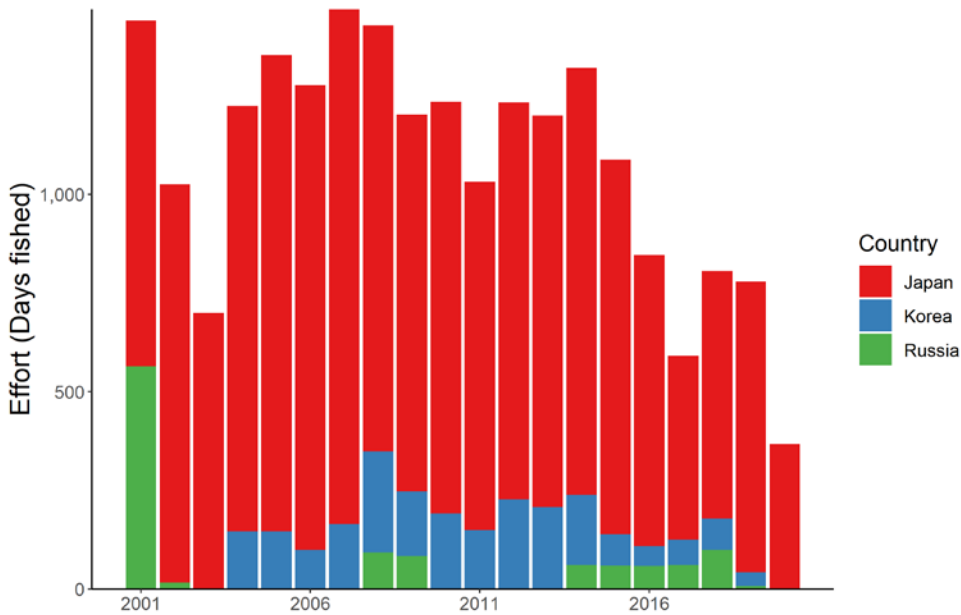


Figure 4. Historical fishing effort for North Pacific armorhead. The annual fishing efforts by each country are shown by barplot. The efforts are calculated by the total fishing days operated during the year

Assessment

There is no current or accepted assessment for North Pacific armorhead.

There are no biomass estimates available for this species in NPFC waters. An age- or length-structured stock assessment is unlikely to be feasible given the life history of North Pacific armorhead. Data limited approaches may be examined in the future.

Management

Active Management Measures

The following NPFC conservation and management measures pertain to this species:

- CMM 2021-05 For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean
- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Item	Status	Comment
Biological reference points	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	Upper limit: 15,000 tons (only for Japan), No operation from November to December
Harvest control rule	Not accomplished	See below
Other	Intermediate	No expansion of fishing beyond established areas, No operation in the designated areas, No more increase in the fishing vessels, Restriction of trawl mesh size

In 2019, an adaptive management plan was implemented for North Pacific armorhead (NPFC-2019-SSC BF02-WP05, CMM 2019-05). This plan specifies data collection via an annual monitoring survey to be conducted in March-June each year on Koko, Yuryaku, Kammu and/or Colahan Seamounts. If the survey finds evidence of strong recruitment (see CMM 2021-05 and NPFC-2019-SSC BF02-IP01 for details) some areas in the Emperor

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Seamounts are closed and a 12,000 ton catch limit is encouraged. In low recruitment years, a 700 ton catch limit is encouraged.

Data Summary

Catch data

Data	Country	Source	Fishery	Year	Comments
Annual catch	Japan	Commercial	Trawl	1969-present	
		Commercial	Gillnet	1990-present	
	Korea	Commercial	Trawl	2004-2019	Catches are collected by electronic reporting system since 2015. Catches before 2015 are from the fishing catch provided by the fishery company
	Russia	Commercial	Trawl	1970-1987; 1997; 2001-2002; 2005-2006; 2011; 2013	Data coverage details to be reviewed
CPUE	Japan	Commercial	Trawl	1970-present	Possible impact by misreporting (NPFC-2018-TCC03-Final Report), Digitization of old (before 1989) data has not been completed
		Commercial	Gillnet	2008-present	
		Survey	Trawl	2019-present	Preliminary surveys in 2018 not included

Korea	Commercial	Trawl	2013-2019	One fishing vessel. Standardization?
Russia	Commercial	Trawl	2001-2002; 2005-2006; 2011; 2013	Data coverage details to be reviewed
	Survey	Trawl	1997	Data coverage details to be reviewed

Biological data

Data	Country	Year	Comments
Length	Japan	2009-present	Protocol revised (see NPFC-2018-SSC BF01-WP03)
	Korea	2013-2019	Data coverage review
	Russia	NA	Data coverage details to be reviewed
Age	Japan	NA	A preliminary daily ring analysis for ca. 300 fish
	Korea	2013-2017, 2019	Details to be reviewed
	Russia	NA	Data coverage details to be reviewed
Maturity	Japan	2013-present	
	Korea	2013-2019	Data coverage review

Russia	1970-1987; 1997; 2011; 2013	Data coverage details to be reviewed
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- Technical and Compliance Committee. 2018. 3rd Meeting Report. NPFC-2018-TCC03-Final Report. 83 pp. (Available at www.npfc.int)

Species summary for splendid alfonsino

Splendid alfonsino (*Beryx splendens*)

Common names: Splendid alfonsino (English); 红眼金鲷 (Chinese); キンメダイ (Japanese); 빛금눈돔 (Korean); Низкотельный берикс (Russian)

Biological Information

Global distribution ranges from tropical to temperate oceans. Historical catch records in the Emperor Seamount suggest the distribution from Nintoku (45 °N) to Hancock (30 °N). Settlement occurs following a certain period of the pelagic life stage. Adults show a vertical distribution from 200 to 800 m with diel vertical migration, feeding on crustaceans, cephalopods, and fish during the night. Limited information is available for recruitment and reproduction processes in the Emperor Seamounts, whereas the population in the Japanese coast shows 4–5 years to sexually mature and spawning occurs during summer (Shotton 2016).

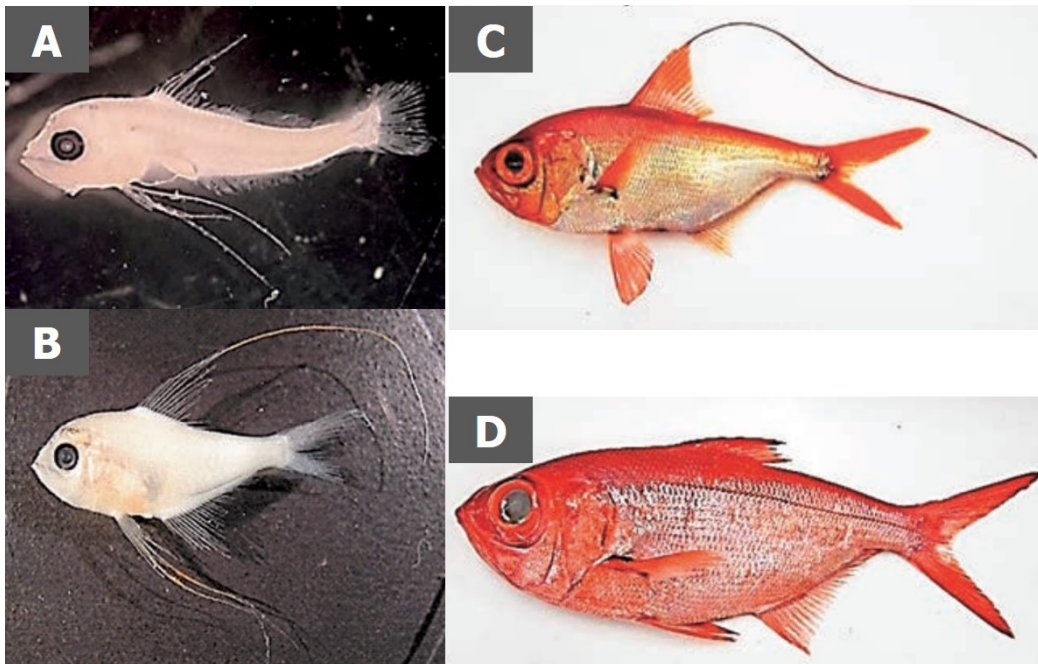


Figure 1: Photographs of splendid alfonsino on different developmental stages A) postlarva, B) juvenile, C) young, D) adult (from Watari et al. 2017)

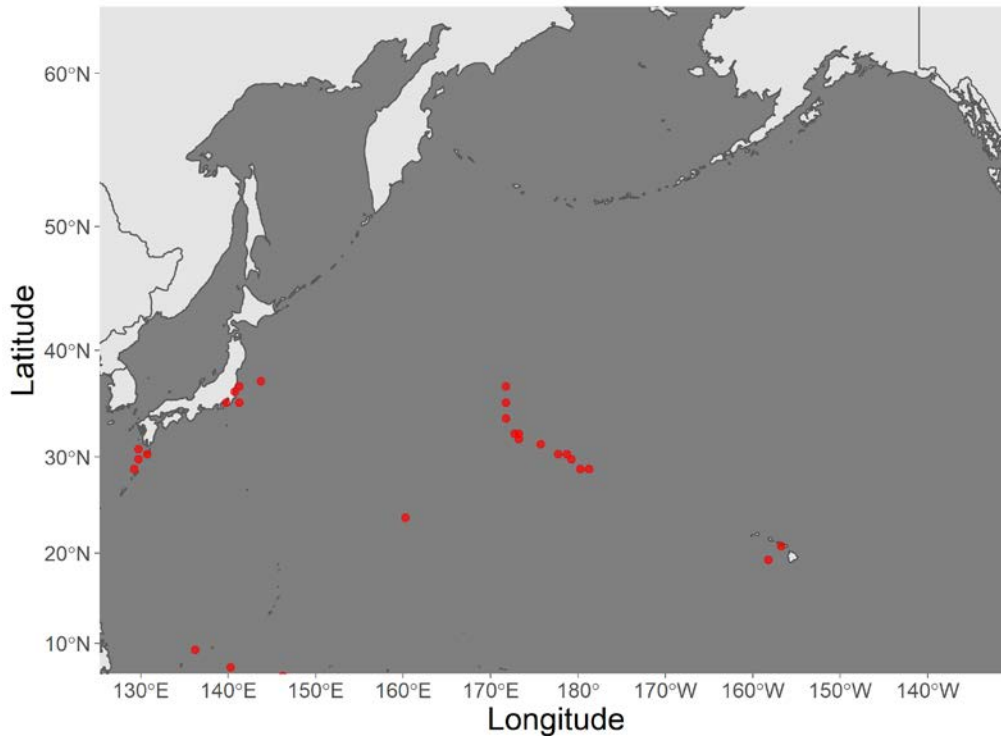


Figure 2: Known distribution of splendid alfonsino around NPFC waters. Points indicate observation data from original sources (AquaMaps 2019, October)

Fishery

Since the discovery of large populations of North Pacific armorhead in the Emperor Seamount in the late 1960s, splendid alfonsino has been exploited as an alternative resource to the armorhead due to the large temporal fluctuation of the armorhead population. The main fishing methods are bottom trawls and gillnets.

Historical catch record (Figure 3) shows the highest catch proportion by Japan, followed by Korea and Russia. Russia terminated their fishery nearly a decade ago. Fishing pressure somewhat reflects the recruitment condition of North Pacific armorhead. In 2010 and 2012, when high recruitment of the armorhead occurred, the annual catch decreased below 1,000 tons, whereas it increased up to 4,000 tons ever since then.

Size composition analysis from the catch data by Japanese trawlers suggests the substantial decrease in size of fish in catches over the past decade, raising the concern about recruitment overfishing (Sawada et al. 2018).

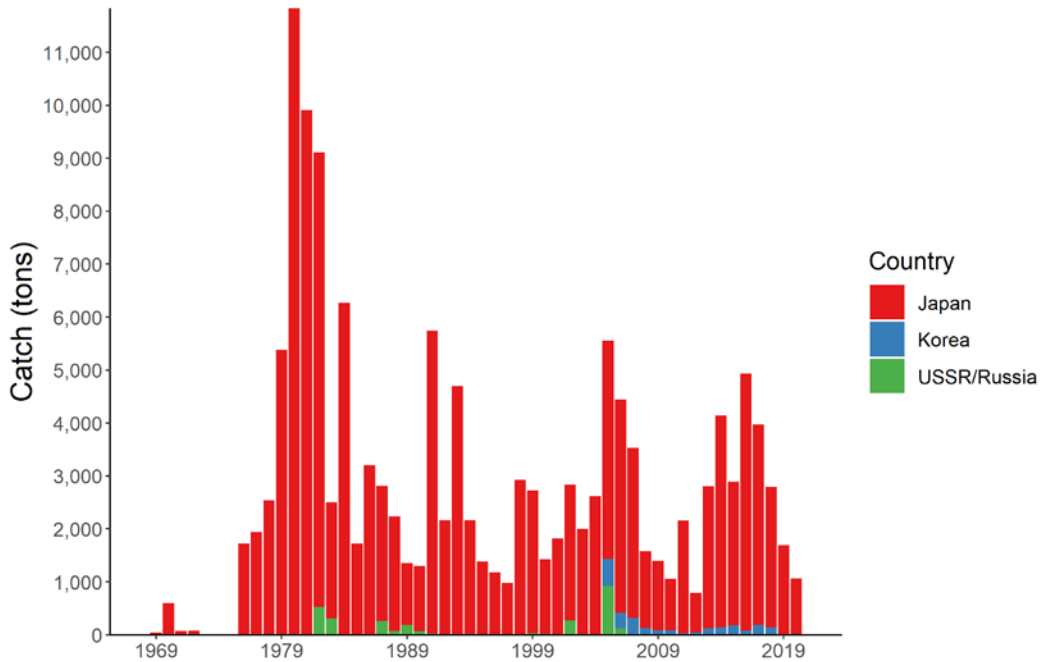


Figure 3: Historical trends of splendid alfonsino catches in NPFC waters. The annual amounts of catch by each country are shown by the bar plot.

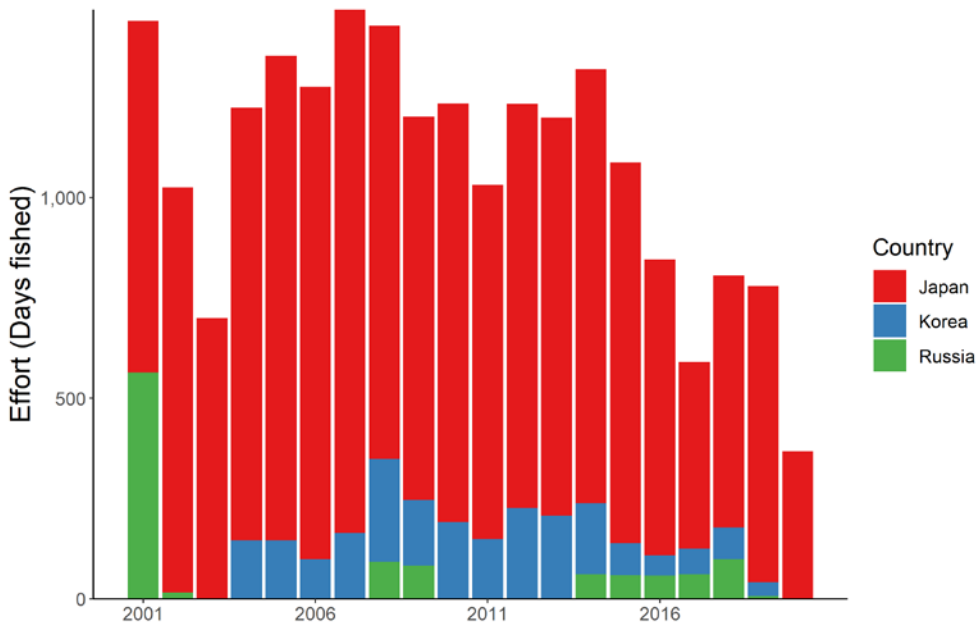


Figure 4. Historical fishing efforts for splendid alfonsino. The annual fishing efforts by each country are shown by barplot. The efforts are calculated by the total fishing days operated during the year

Assessment

There are no biomass estimates available for splendid alfonsino in NPFC waters.

An age- or length-structured stock assessment may be feasible given the life history of this species. Surplus production models developed by Japan in 2008 showed that the average fishing mortality is 20–28 % higher than the MSY level (Nishimura and Yatsu 2008). This analysis, however, remains unreliable as the estimated CPUE is biased due to target shifts between North Pacific armorhead and splendid alfonsino and the estimated intrinsic population growth rate parameter was too high for long-lived deep-sea fish.

Data limited approaches, such as YPR or SPR analysis that do not require detailed resource parameters or fishing data, should be explored in the future.

Management

Active Management Measures

The following NPFC conservation and management measures pertain to this species:

- CMM 2021-05 For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean
- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Item	Status	Comment
Biological reference points	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	No operation from November to December
Harvest control rule	Not accomplished	Not established
Other	Intermediate	No expansion of fishing beyond established areas, No operation in the designated areas, No more increase in the fishing vessels, Restriction of trawl mesh size

Currently, there is no accepted harvest control rule for this species.

In 2016, the management measures were implemented, which includes limiting the fishing effort to the 2007's level, prohibiting fisheries from November to December (which corresponds to the spawning season for North Pacific armorhead) and not allowing fisheries in C-H Seamount and the southeastern part of Koko Seamount (for the protection of VMEs).

In 2019, an additional measure was adopted, which includes the regulation of the mesh size (trawl: > 10 cm) to protect juvenile fish. Effectiveness of this measure yet to be clearly demonstrated (Sawada and Ichii 2020).

Data Summary

Catch data

Data	Country	Source	Fishery	Year	Comments
Annual catch	Japan	Commercial	Trawl	1969-present	
		Commercial	Gillnet	1990-present	
	Korea	Commercial	Trawl	2004-2019	Catches are collected by electronic reporting system since 2015. Catches before 2015 are from the fishing catch provided by the fishery company
	Russia	Commercial	Trawl	1969-1988; 2002; 2005; 2006; 2010; 2011; 2013; 2019	Data coverage details to be reviewed
CPUE	Japan	Commercial	Trawl	1970-present	Possible impact by misreporting (NPFC-2018-TCC03-Final Report)
		Commercial	Gillnet	2008-present	
			Survey	Trawl	
	Korea	Commercial	Trawl	2013-2019	One fishing vessel. Standardization?

Russia	Commercial	Trawl	1969-1988; 2010; 2019	Data coverage details to be reviewed
	Survey	Trawl	1969-present	Data coverage details to be reviewed

Biological data

Data	Country	Year	Comments
Length	Japan	2009-present	Protocol revised (see NPFC-2018-SSC BF01-WP03)
	Korea	2013-2019	Data coverage review
	Russia	NA	Data coverage details to be reviewed
Age	Japan	2013-present	Annual ring analysis
	Korea	2013-2017, 2019	Details to be reviewed
	Russia	NA	Data coverage details to be reviewed
Maturity	Japan	2013-present	
	Korea	2013-2017, 2019	Data coverage review
	Russia	1969-1988; 2010; 2011; 2013; 2019	Data coverage details to be reviewed

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Species summary for sablefish

Sablefish (*Anoplopoma fimbria*)

Common names:

Black cod (Canada and USA); ... (China); ギンダラ [Gindara] (Japan); 은대구 [Eun-Daegu] (Korea); угольная рыба [ugolnaya riba] (Russia); ... (Chinese Taipei).

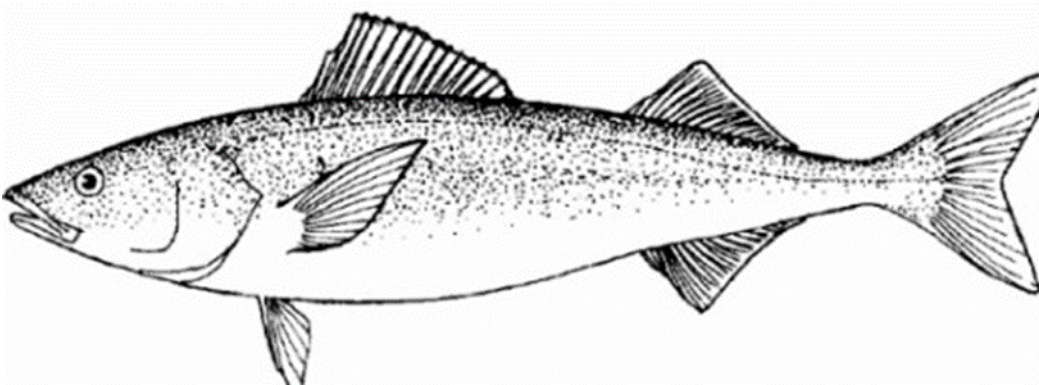


Figure 1. Sablefish (*Anoplopoma fimbria*).

Management

Active NPFC Management Measures

The following NPFC conservation and management measures (CMM) pertains to this species:

- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean
- CMM 2019-10 For Sablefish in the Northeastern Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management Summary

The current management measure for sablefish specifies both catch and effort limits. The allowable catch of sablefish in the eastern portion of the Convention Area is based on a long-term mean of historical catches from seamounts by Canada. It allows for 34 mt to be landed each month for the 6 months of the fishing season (April to September). The fishery is also managed through input controls by only allowing a single vessel to fish in each month. The 1-3 Canadian vessels licensed to fish in the NPFC Convention Area are submitted to the NPFC Secretariat annually.

Table 1. Management Summary

Convention or Management Principle	Status	Comment or Consideration
Biological reference point(s)	Unknown	Established for USA and Canada assessments
Stock status	Known	Healthy (in USA and Canada assessments)
Catch limit	Known	Allowable catch of 34 mt per month (6 month season)
Harvest control rule	Undefined	Established for USA and Canada assessments
Other	Known	Effort control (single vessel per month)

Assessment

Although genetic and other evidence indicates there is a single stock of sablefish in the eastern North Pacific Ocean (including the NPFC Convention Area), three stock assessments are carried out in the three domestic jurisdictions Alaska (U.S.A.), British Columbia (Canada) and the U.S. West Coast (U.S.A.) where sablefish are harvested.

Canada uses a management strategy evaluation (MSE) process to generate recommended harvest each year. Underlying the MSE is a statistical catch-at-age structured operating model (stock assessment model) that gets updated on a 3 – 5 year cycle (DFO 2016, DFO 2020). The USA conducts two stock assessments (one for Alaska and one for the US West Coast). Both are conducted using age-structured models and are routinely updated. The current Alaska assessment (Goethel et al. 2020) and most recent USA West Coast assessment (Haltuch et al. 2019, Kapur et al. 2021) are available online.

Data

Surveys

Canada has conducted two longline trap surveys in British Columbia waters. From 1990-2009 a standardized trap survey was conducted at set stations annually. From 2003 to the present DFO conducts a stratified random trap survey along the outer shelf and slope of the BC coast. Both of these surveys generate a fishery independent CPUE as well as biological data that is used in the assessment. In Alaska, three survey indices are available for use in assessing the status of the sablefish population. There is a longline survey conducted at standard survey stations that provides a relative index of abundance. It has been conducted at depths from 200-1000 m annually since 1978 (cooperatively with Japan from 1978- 1994). Bottom trawl surveys are conducted annually or biennially in the three main ecosystems in Alaska since 1982. The U.S. West Coast primarily uses fishery independent survey data from the west coast groundfish bottom trawl survey conducted from 2003-2018 over depths of 55 to ~1300 m as an index of sablefish abundance. The bottom trawl survey follows a random-stratified survey design with four vessels (in most years) conducting the

survey annually. The trawl survey data is analyzed with the VAST model (Thorson 2019) to produce the index of abundance for sablefish.

There is currently no survey conducted in the eastern NPFC Convention Area that captures or monitors sablefish populations.

Fishery

The Canadian high seas Sablefish fishery typically operates at 1-4 seamounts in the commission area (Cobb, Eickleberg, Warwick and Brown Bear seamounts).

Historically other seamounts have been fished for sablefish both inside and outside Canada's EEZ. Fishing is conducted with longlined traps. Since 2014 a maximum of 3 vessels per year have been allowed to fish in NPFC waters. Historically the number of fishing vessels has averaged <3 per year (since 2008). The number of fishing days is the number of unique calendar days during which gear was set. The number of fishing days has averaged from about 25 to greater than 100, but in most years has averaged between 50 and 75 (Figure 2). In 2021 the number of unique vessels fishing in the convention area was 0 and the number of fishing days was 0.

Both Canada and the U.S.A. have large domestic fisheries that target sablefish inside their EEZ's. Sablefish is also captured as bycatch in domestic trawl fisheries in Canada and the U.S.A.

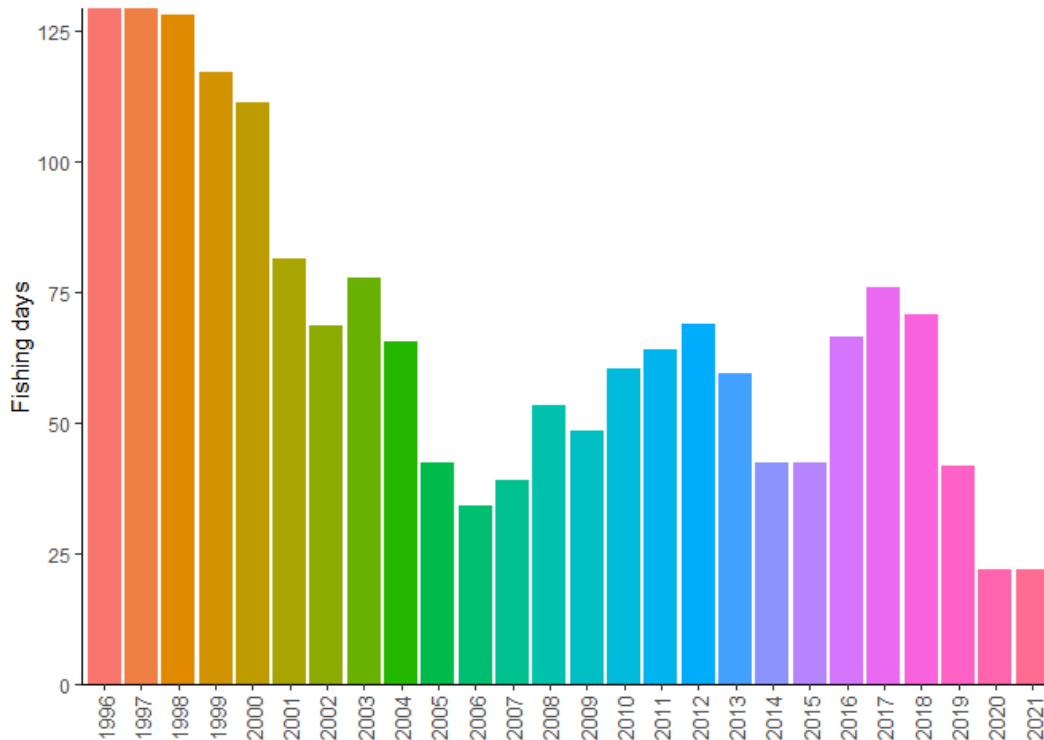


Figure 2. Fishing effort (in number of fishing days) for the sablefish longline trap fishery conducted in NPFC waters (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

Output controls limit the amount of fish that can be landed during a trip. Authorized vessels are subject to monthly vessel limits of 34 mt of Sablefish, 2.3 mt of combined Rougheye and Blackspotted rockfish and 0.45 mt of other rockfish, sole and flounder (all in round weight). These measures have been in place since 2011.

Catches of Sablefish from NPFC region seamounts has ranged from an average of about 10 mt per year in 2005-2008 to about 67 mt in 2017 (Figure 3). Average annual catches were relatively low from 2002 to 2016 at NPFC seamounts and then increased in 2017-2018, with a decline to low levels in the last years. This increase in part probably reflects shifting effort due to closures of seamounts within Canada’s EEZ. An examination of coastwide shifts in the spatial pattern of fishing effort showed that fishing effort has become concentrated on Cobb Seamount, with increasing effort in shallower waters relative to the past (Figure 4). The catch of sablefish from the Convention Area in 2021 was 0 mt.

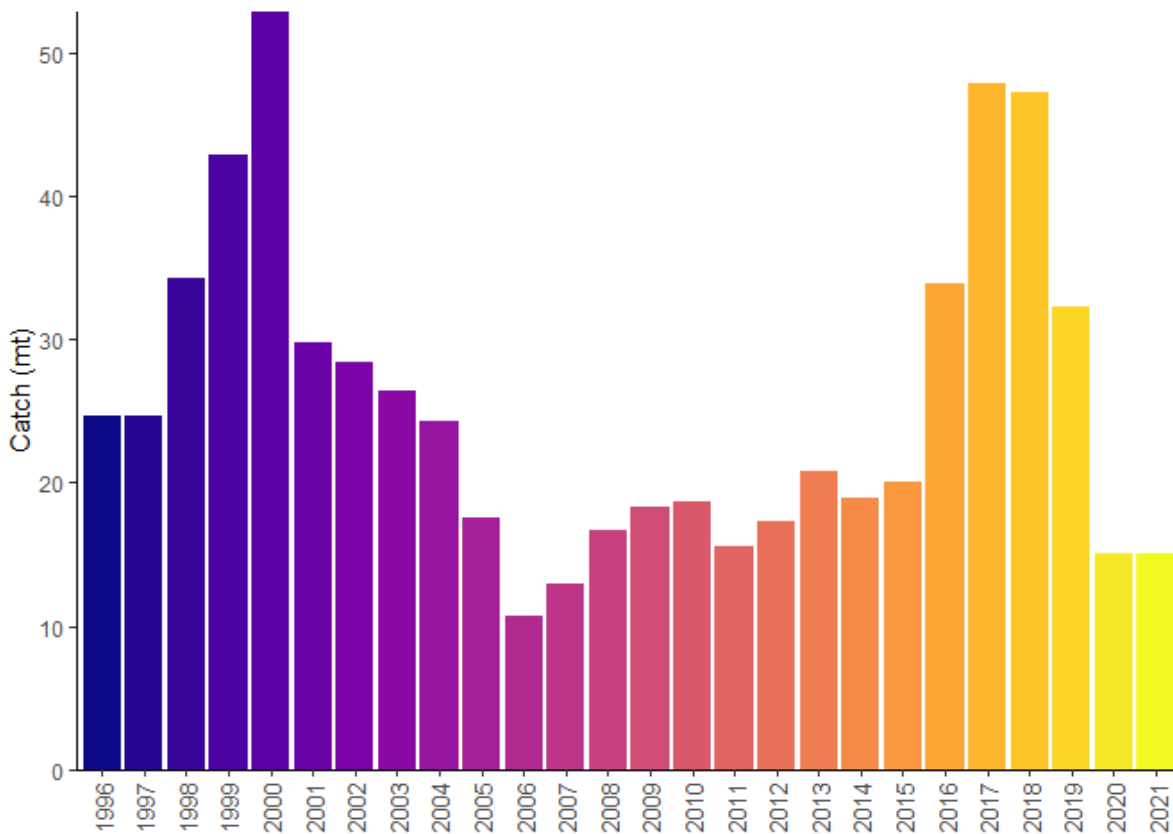


Figure 3. Landings of sablefish in the Canadian Sablefish fishery in NPFC region (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

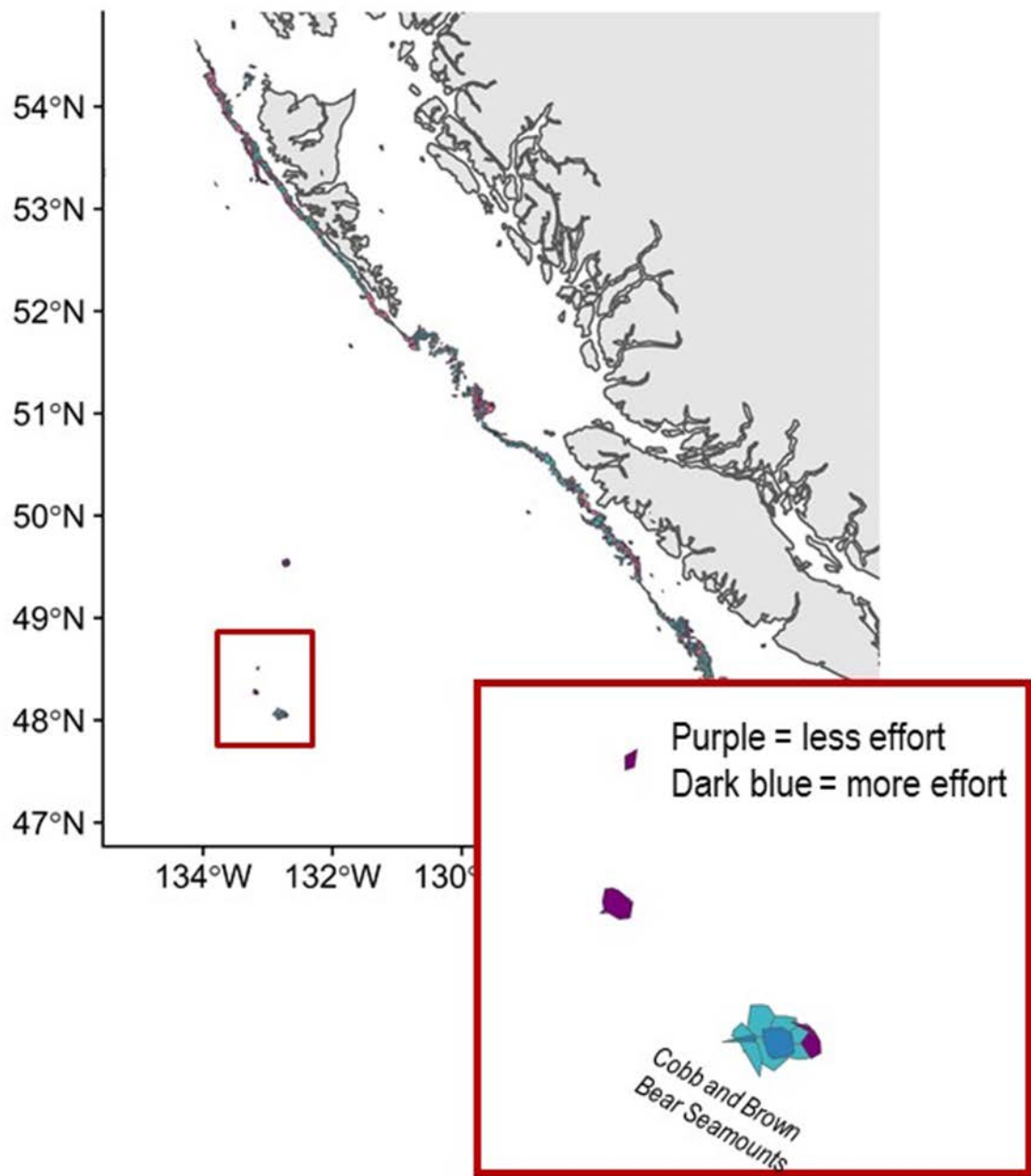


Figure 4. Relative change in spatial distribution of effort for Sablefish trap fishery from 2010-2017 to 2018-2019. Inset shows seamounts in the NPFC Convention Area.

Catch per unit of effort (mt/fishing days) for Sablefish has been increasing over the last 10 years (Figure 5), averaging 0.42 mt/fishing day (CV = 51%). CPUE was not calculated in 2021, but has generally been increasing since 2012.

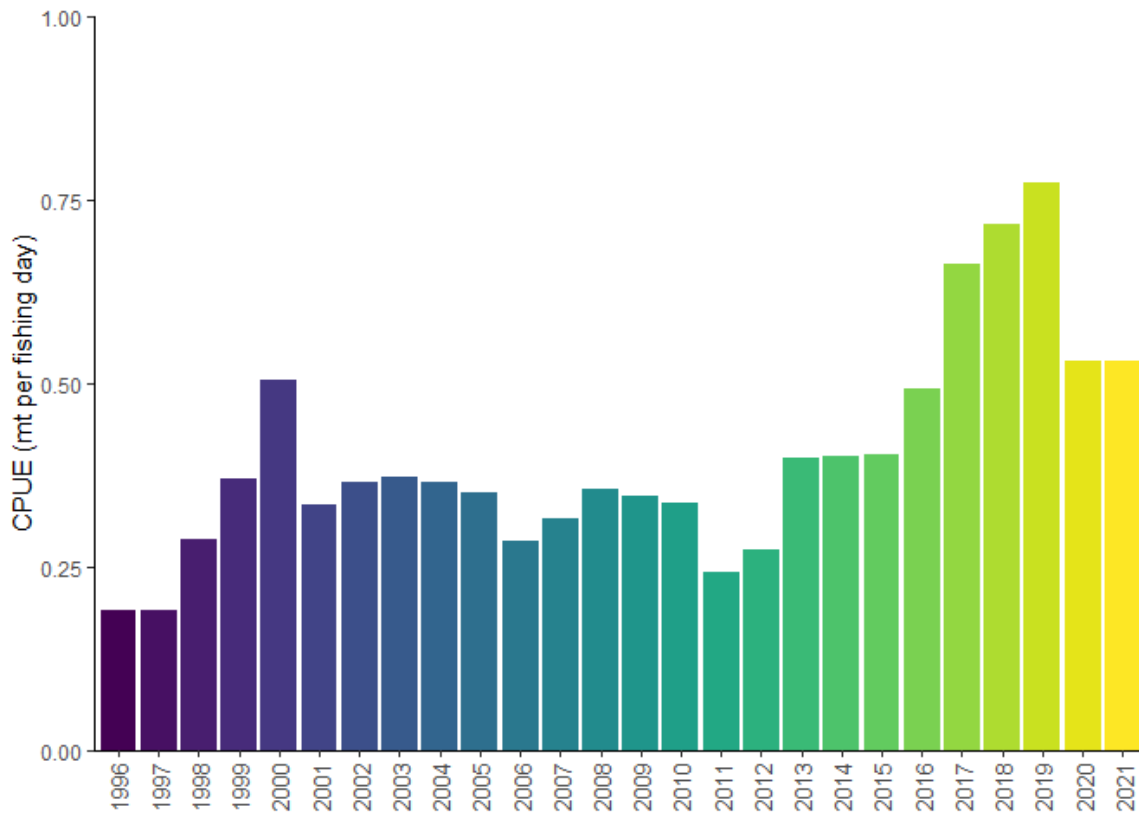


Figure 5. Catch per unit of effort for Canadian Sablefish fishery in NPFC region. Data are averaged across 3 years to comply with data privacy restrictions.

Biological collections

Under the seamount fishing protocol, 5 randomly selected fish per trip are saved by the vessel for sampling when it returns to port. These sablefish are sampled for length, weight and sex. Otoliths are collected for age estimation.

In 2020 due to COVID 19 restrictions, there were no biological samples collected from Sablefish captured in the Convention Area. Historical data will be provided to the NPFC Science Committee, when and as required, in conjunction with the NPFC's Interim Guidance for Management of Scientific Data Used in Stock Assessments.

Domestic fisheries in the U.S.A. and Canada also collect biological data. Data including length, weight and sex are collected from the scientific survey and by observers and dockside samplers from the commercial fisheries. Otoliths for estimating fish ages are also collected from both the surveys and the fisheries.

Table 2. Data availability from Members regarding sablefish

Data	Source	Years	Comment
Catch	Canada	1965-present	Catches from national waters and convention area
	USA	~1960-present	Catches in national waters
CPUE	Canada	~1988-present	not developed
	USA	~1988-present	
Survey	Canada	1990-2009	Longline trap standard survey
	Canada	2003-present	Longline trap random survey
	USA	1978-present	Alaska longline survey
	USA	1982-present	Alaska bottom trawl survey
	USA	2003-present	West Coast bottom trawl survey
Age data	Canada	variable	Commercial and survey catches including NPFC Convention Area
	USA	variable	Commercial and survey catches
Length data	Canada	variable	Commercial and survey catches including NPFC Convention Area
	USA	variable	Commercial and survey catches
Maturity/fecundity	Canada	variable	Commercial and survey catches in national waters
	USA	variable	Commercial and survey catches

Special Comments

None

Biological Information

Distribution

Sablefish are widely distributed throughout the Pacific Ocean from northern Mexico to the Gulf of Alaska, westward to the Aleutian, and northward into the Bering Sea (Figure 6; Wolotira et al. 1993). They are also found along the western margin of the Pacific Ocean from southern Japan through the Kamchatka Peninsula and northward into the Bering Sea. Adult sablefish occur along the continental slope, shelf gullies, and in deep fjords, generally at depths greater than 200 m. Juvenile sablefish spend their first two to three years on the continental shelf at shallower depths. Spawning is generally in the winter and spring (October-April) and occurs near the shelf break. Spawning timing generally occurs earlier in the south (October- February in California) and later in the north (January – April in Alaska). Eggs are found at depth and larvae are found in surface waters (Shotwell

et al. 2020).

Life history

Larval sablefish feed on zooplankton prey. Juveniles shift from pelagic to benthic prey including fishes and invertebrates. Adults consume mostly benthic fishes and invertebrates. Sablefish mature at 4 to 5 years. In the eastern Pacific, Sablefish have traditionally been thought to form two populations based on differences in growth rate, size at maturity, and tagging studies. The northern population inhabits Alaska and northern British Columbia waters and the southern population inhabits southern British Columbia, Washington, Oregon, and California waters, with mixing of the two populations occurring off southwest Vancouver Island and northwest Washington. However, recent genetic work by Jasonowicz et al. (2017) found no population sub-structure throughout their range along the US West Coast to Alaska, and suggested that observed differences in growth and maturation rates may be due to phenotypic plasticity or are environmentally driven. Tagging evidence suggests that the sablefish inhabiting seamounts in the NPFC Convention Area are not distinct from the coast wide sablefish population.

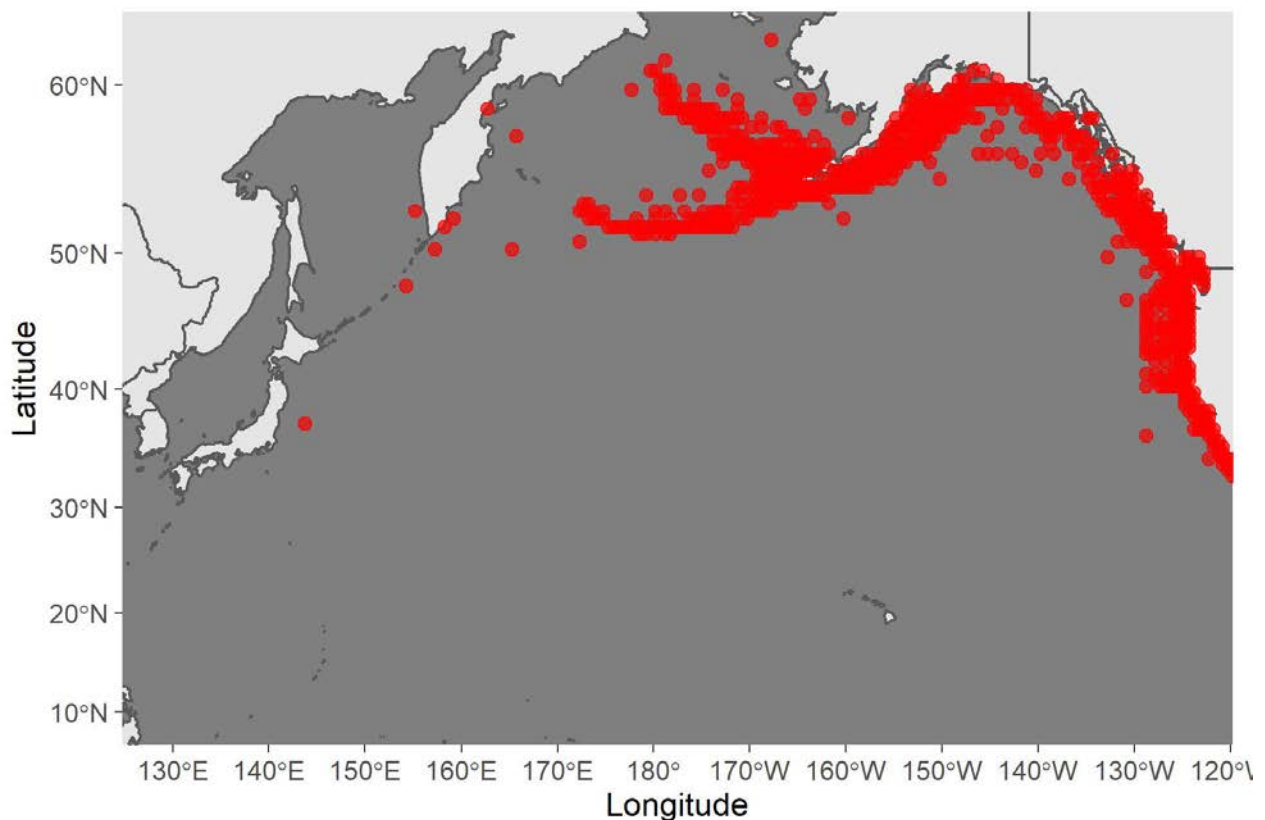


Figure 6. Map of distribution of sablefish in the North Pacific.

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Species summary for blackspotted and roughey rockfishes

Blackspotted and Roughey Rockfishes (*Sebastes melanostictus* and *Sebastes aleutianus*)

Common names:

Blackspotted Rockfishes

... (China); アラメヌケ [Aramenuke] (Japan); ... (Korea); (Russia); ... (Chinese Taipei).

Roughey Rockfishes

... (China); No common name (Japan); ... (Korea); (Russia); ... (Chinese Taipei).

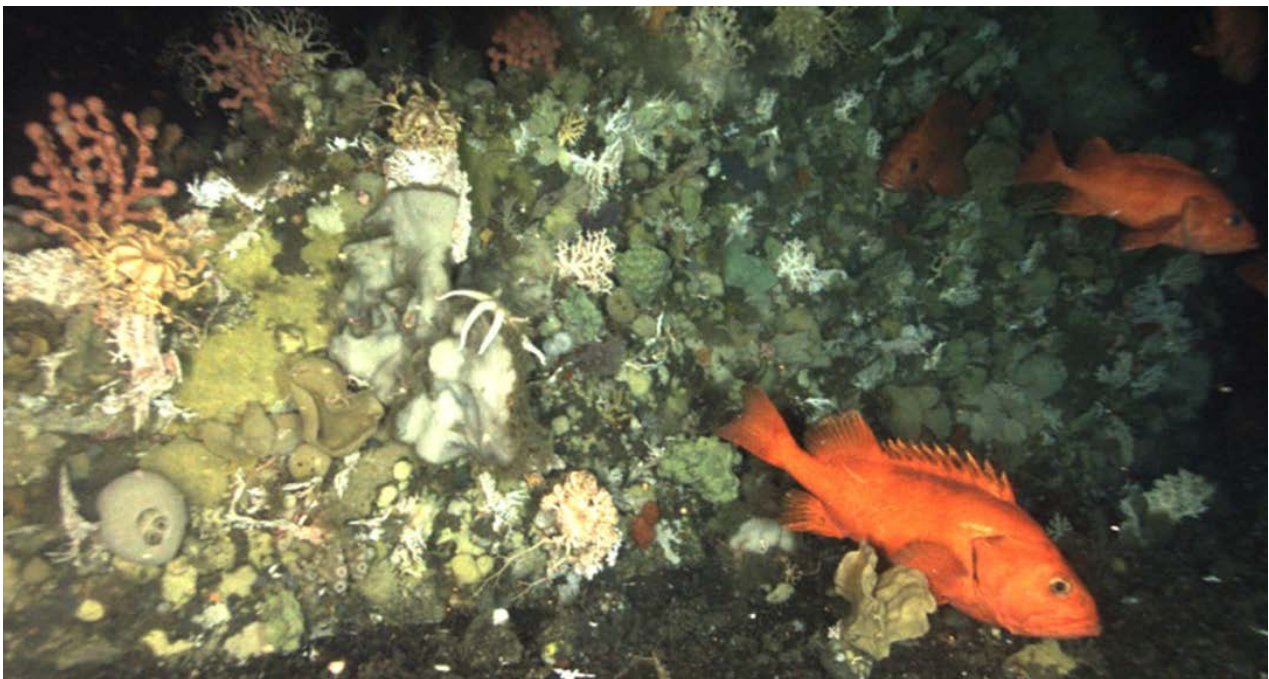


Figure 1. Blackspotted rockfish (*Sebastes melanostictus*).

Management

Active NPFC Management Measures

The following NPFC conservation and management measures (CMM) pertains to these species:

- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean
- CMM 2019-10 For Sablefish in the Northeastern Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management Summary

Blackspotted and rougheye rockfishes are captured in the longline trap fishery that targets sablefish (*Anaplopoma fimbria*) at seamounts in the eastern part of the NPFC Convention Area. The current management measure for blackspotted and rougheye rockfishes specifies both catch and effort limits. The allowable catch of blackspotted and rougheye rockfishes in the eastern portion of the Convention Area is based on a long-term mean of historical catches from seamounts by Canada. It allows for 2.3 mt to be landed each month for the 6 months of the fishing season (April to September). The fishery is also managed through input controls by only allowing a single vessel to fish in each month. The 1-3 Canadian vessels licensed to fish in the NPFC Convention Area are submitted to the NPFC Secretariat annually.

Table 3. Management Summary

Convention or Management Principle	Status	Comment or Consideration
Biological reference point(s)	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Known	Allowable catch of 2.3 mt per month (6 month season)
Harvest control rule	Not accomplished	Not established
Other	Known	Effort control (single vessel per month)

Assessment

No stock assessment is conducted for blackspotted and rougheye rockfishes in the NPFC Convention area.

It is unclear if the blackspotted and rougheye rockfish population on seamounts in the NPFC Convention Area is distinct from the population on the continental shelf of Canada. There is evidence of population structure in other regions, such as Alaska, where population trends and genetics indicate some structure on the order of

~1000 km (Shotwell and Hanselman 2019, Gharrett et al. 2007, Shotwell et al. 2014). This is about twice the distance from the continental shelf to the fished seamounts in the NPFC Convention Area, however there is potentially a large barrier to dispersal of deepwater between the shelf and the seamounts. There is no available tagging data to indicate whether the blackspotted and rougheye rockfishes at seamounts are connected to populations in domestic waters on the continental shelf. It is likely that the seamount populations are distinct stocks with distinct population trajectories.

Domestic stock assessments for blackspotted and rougheye rockfishes conducted in Canada assume

there are two populations in domestic waters. These are assessed using a statistical catch at age model (DFO 2020). Assessments are also carried out in Alaska (Shotwell and Hanselman 2019, Spencer et al. 2018).

Data

Surveys

There is currently no survey conducted in the eastern NPFC Convention Area that captures or monitors blackspotted and rougheye rockfish populations.

Fishery

The Canadian high seas sablefish fishery typically operates at 1-4 seamounts in the commission area (Cobb, Eickleberg, Warwick and Brown Bear seamounts).

Historically other seamounts have been fished for blackspotted and rougheye rockfishes both inside and outside Canada's EEZ.

Fishing is conducted with longlined traps. Since 2014 a maximum of 3 vessels per year have been allowed to fish in NPFC waters. Historically the number of fishing vessels has averaged <3 per year (since 2008). The number of fishing days is the number of unique calendar days during which gear was set. The number of fishing days has averaged from about 25 to greater than 100, but in most years has averaged between 50 and 75 (Figure 2). In 2021 the number of unique vessels fishing in the convention area was 0 and the number of fishing days was 0.

Both Canada and the U.S.A. have domestic fisheries that target blackspotted and rougheye rockfishes inside their EEZ's. Blackspotted and rougheye rockfishes is also targeted in domestic trawl fisheries in Canada and the U.S.A.

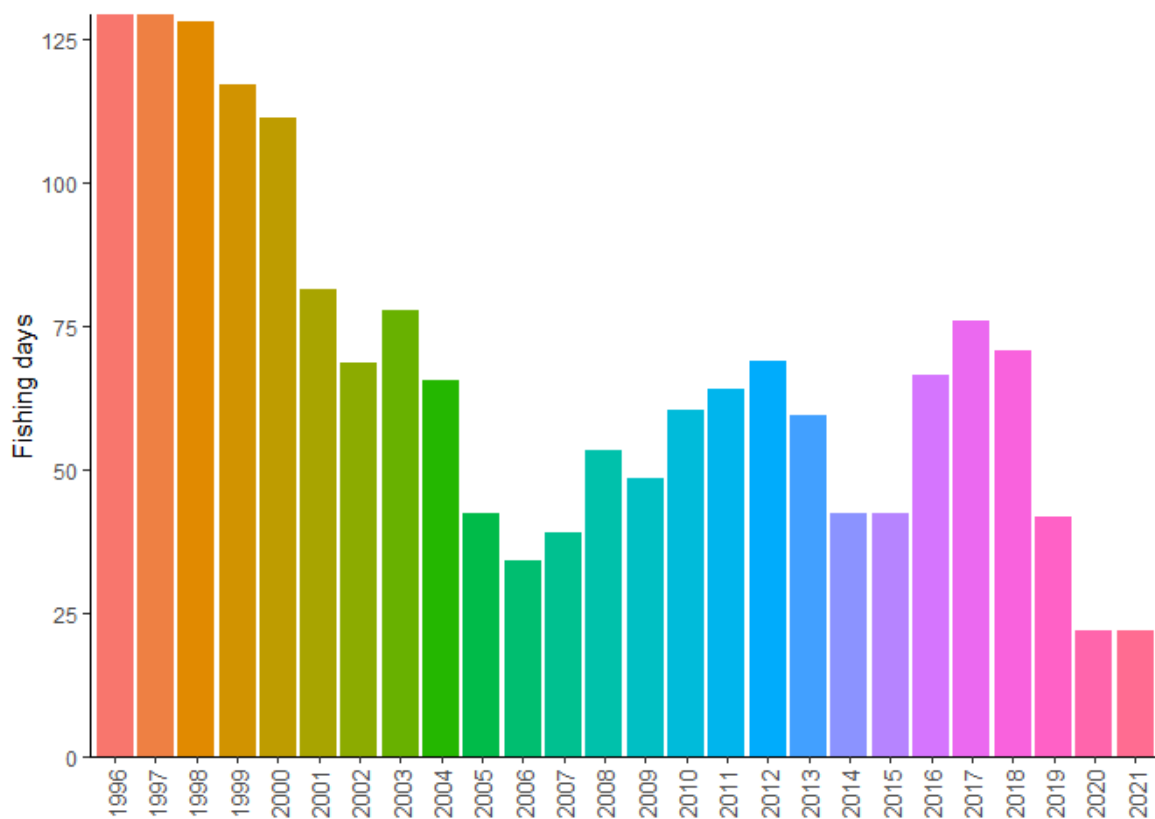


Figure 2. Fishing effort (in number of fishing days) for the sablefish longline trap fishery conducted in NPFC waters (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

Output controls limit the landings of combined rougheye and blackspotted rockfish to 2.3 mt (in round weight). These measures have been in place since 2011.

Catches of blackspotted and rougheye rockfishes from NPFC region seamounts has ranged from an average of about 0.5 mt per year in 1996-2014 to about 4 mt in 2017 (Figure 3). Average annual catches were relatively low from 1996 to 2016 at NPFC seamounts and then increased in 2017-2018, with a decline to low levels in the last years. This increase in part probably reflects shifting sablefish effort due to closures of seamounts within Canada's EEZ. An examination of coastwide shifts in the spatial pattern of fishing effort showed that fishing effort has become concentrated on Cobb Seamount, with increasing effort in shallower waters perhaps reflecting increased targeting of blackspotted and rougheye rockfishes relative to the past (Figure 4). The catch of blackspotted and rougheye rockfishes from the Convention Area in 2021 was 0 mt.

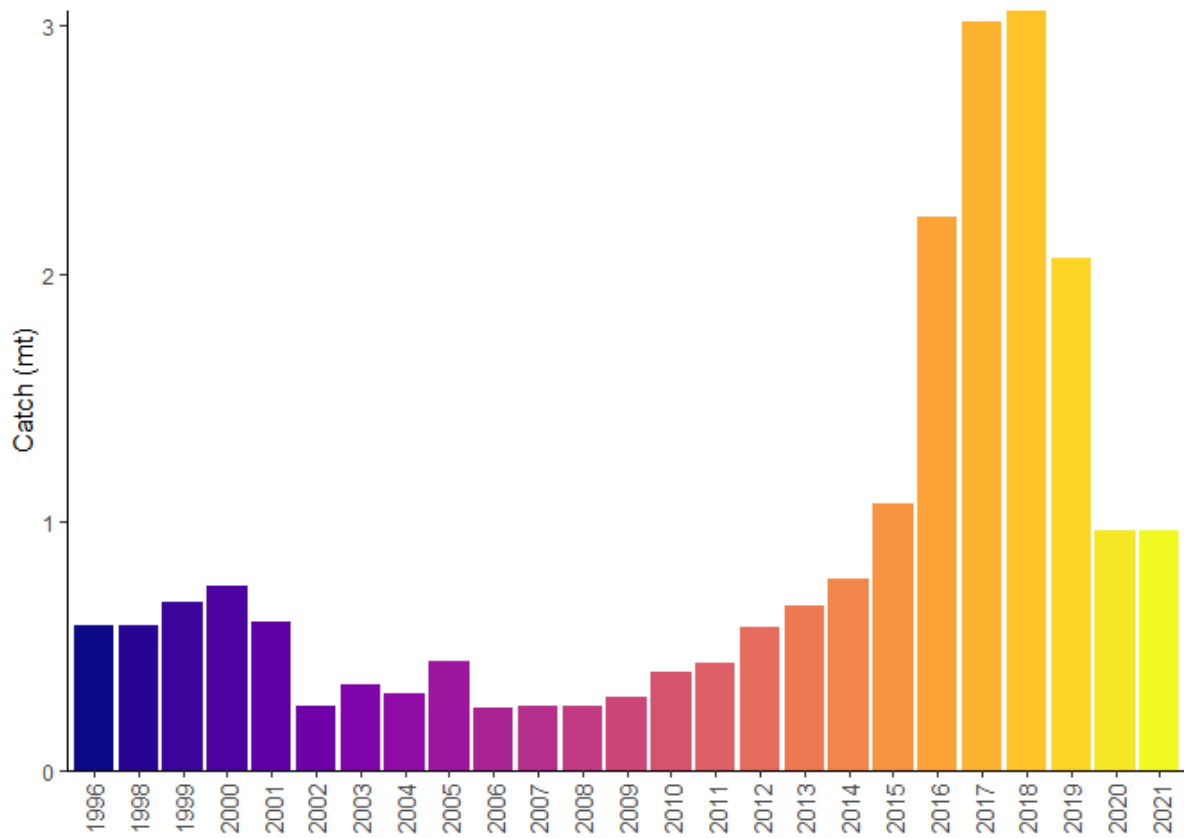


Figure 3. Landings of blackspotted and rougheye rockfishes in the Canadian Sablefish fishery in NPFC region (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

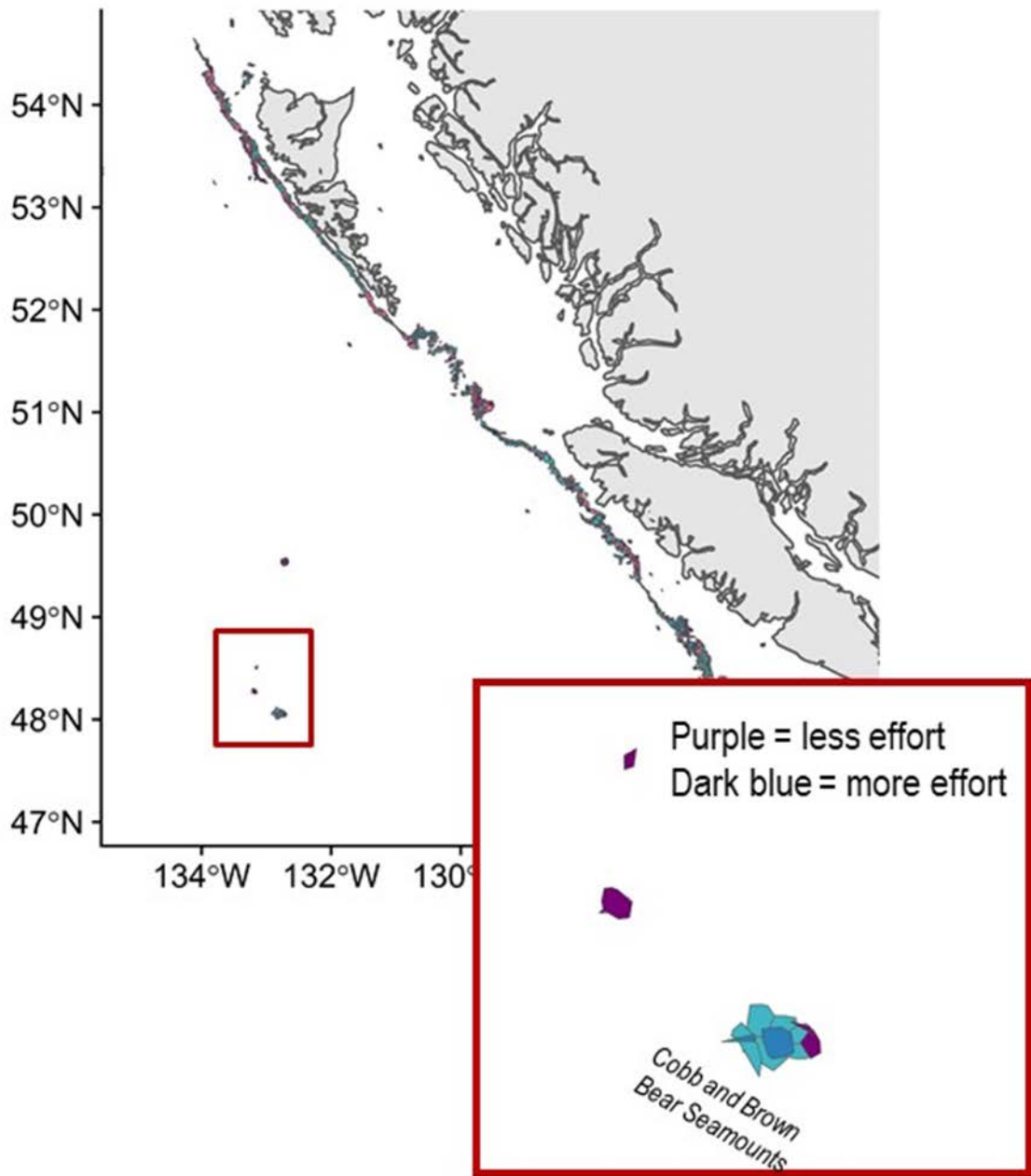


Figure 4. Relative change in spatial distribution of effort for Sablefish trap fishery from 2010-2017 to 2018-2019. Inset shows seamounts in the NPFC Convention Area.

Catch per unit of effort (mt/fishing days) for blackspotted and roughey rockfishes has been increasing over the last 10 years (Figure 5), averaging 0.02 mt/fishing day (CV = 102%). CPUE was not calculated in 2021 due to the absence of fishing in the Convention Area, but has generally been increasing since 2012.

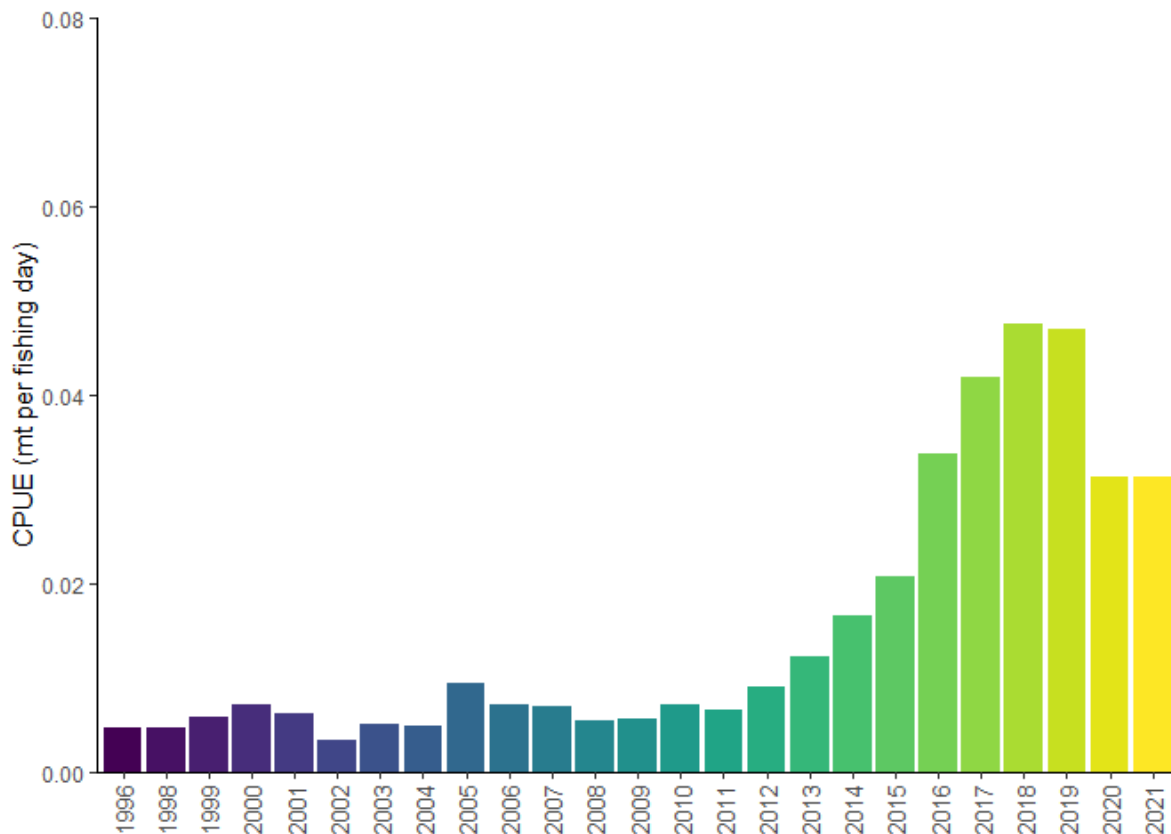


Figure 5. Catch per unit of effort for blackspotted and rougheye rockfishes in the Canadian Sablefish fishery in NPFC region. Data are averaged across 3 years to comply with data privacy restrictions.

Biological collections

No biological collections are taken from blackspotted and rougheye rockfishes captured in the NPFC Convention Area. Biological data are available from domestic fisheries and surveys in Canada.

Table 4. Data availability from Members regarding blackspotted and rougheye rockfishes

Data	Source	Years	Comment
Catch	Canada	1996-present	Catches from national waters and convention area
CPUE	Canada	1996-present	
Survey	None		Survey data are available from Canada and U.S.A. national waters
Age data	None		Data available from Canada and U.S.A. domestic fisheries and surveys

Data	Source	Years	Comment
Length data	None		Data available from Canada and U.S.A. domestic fisheries and surveys
Maturity/fecundity	None		Data available from Canada and U.S.A. domestic fisheries and surveys

Special Comments

None

Biological Information

Distribution

Blackspotted and rougheye rockfishes are widely distributed throughout the Pacific Ocean from California to the Gulf of Alaska, westward to the Aleutian, and northward into the Bering Sea (Figure 6; Love et al. 2002). They are also found along the western margin of the Pacific Ocean from the Kuril Islands through the Kamchatka Peninsula and northward into the Bering Sea. Adult blackspotted and rougheye rockfishes occur in rocky habitat along the continental slope, shelf gullies, and in deep fjords, generally at depths from 150 to 450 m (Love et al. 2002). Juvenile blackspotted and rougheye rockfishes are found at shallower depths (250-300 m) at the continental shelf break. Until recently, these species were considered a single species (rougheye rockfish; Orr and Hawkins 2008).

Life history

Blackspotted and rougheye rockfishes are extremely long-lived, with maximum ages > 200 years. They mature late at about 20 years of age. These characteristics make them vulnerable to overfishing. The species are live-bearing, extruding larvae generally in the spring (February-June). Blackspotted and rougheye rockfishes are benthic feeders, consuming mostly shrimps, crabs and fishes (Yang and Nelson 2000).

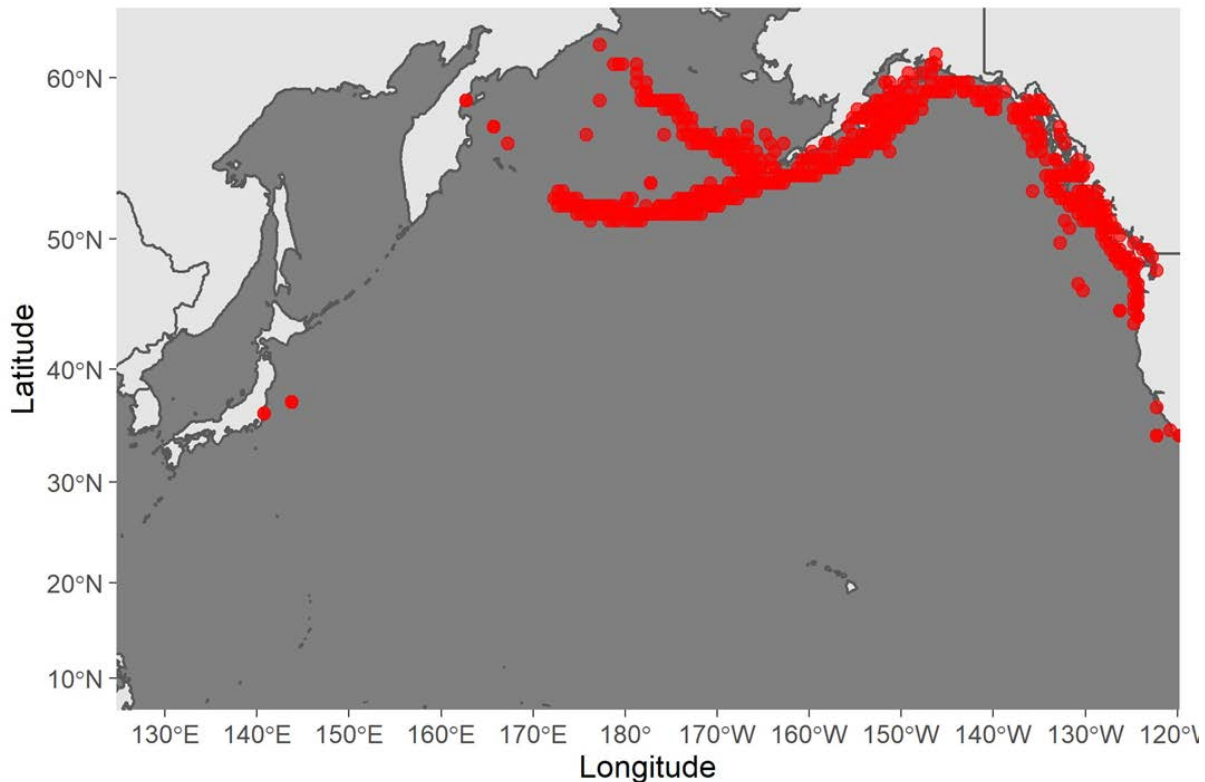


Figure 6. Map of distribution of blackspotted and rougheye rockfishes in the North Pacific.

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Species summary for neon flying squid

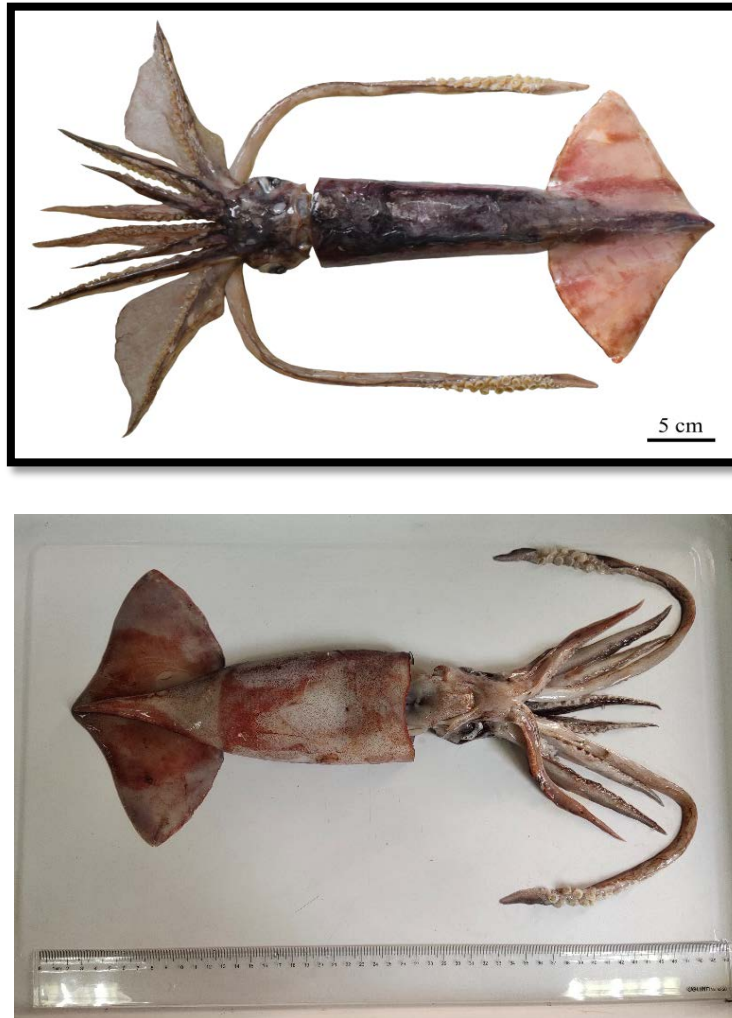


Figure 1. The pictures of neon flying squid

Neon Flying Squid (*Ommastrephes bartramii*)

Common names:

柔鱼 [rou yu] (Chinese); neon flying squid (English); アカイカ [akaika] (Japanese); 빨강오징어 (Korean); Кальмар Бартрама [kalmar bartrama] (Russian); 赤魷 [chi-you] (Chinese Taipei).

Other common names: Red flying squid; Webbed flying squid; Red ocean squid; Kalmar

(<https://www.sealifebase.ca/comnames/CommonNamesList.php?ID=58132&GenusName=Ommastrephes&SpeciesName=bartramii&StockCode=3971>)

Management

Active management measures

The following NPFC conservation and management measure (CMM) pertains to this species:

CMM 2021-11 For Japanese Sardine, Neon Flying Squid and Japanese Flying Squid

Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management summary

Does not specify catch limits.

Members of the Commission and CNCs with substantial harvest of neon flying squid in the Convention Area shall refrain from expansion of the number of fishing vessels authorized to fish such species from the historical existing level. Members of the Commission participating in fishing for the neon flying squid in areas under their jurisdiction adjacent to the Convention Area are requested to take compatible measures.

Table 5. Management Summary

Convention/Management Principle	Status	Comment/Consideration
Biological reference point(s)	●	Not established.
Stock status	○	Status determination criteria not established.
Catch or effort limits	●	Recommended catch, effort limits.
Harvest control rule	●	Not established.
Other	●	MSE...

● OK ● Intermediate ● Not accomplished ○ Unknown

Stock assessment

No unified stock assessment has been conducted by NPFC for the species.

Some members have conducted stock assessment or related studies for neon flying squid based on the information only from their own fisheries or surveys (Ichii et al. 2006; Chen, 2010; Cao et al. 2014).

Data

Survey

Japan conducted drift net survey in summer from 1999-2020 and jigging survey in winter from 2018~2020. Russia conducted upper epipelagic surveys from 1984-1992 and from 1999-2019 (see details in Table 2).

Fishery

Neon flying squid was harvested by China, Japan, Korea, Russia, Chinese Taipei and Vanuatu. Fishing methods included jigging, drift net, dip net and set net.

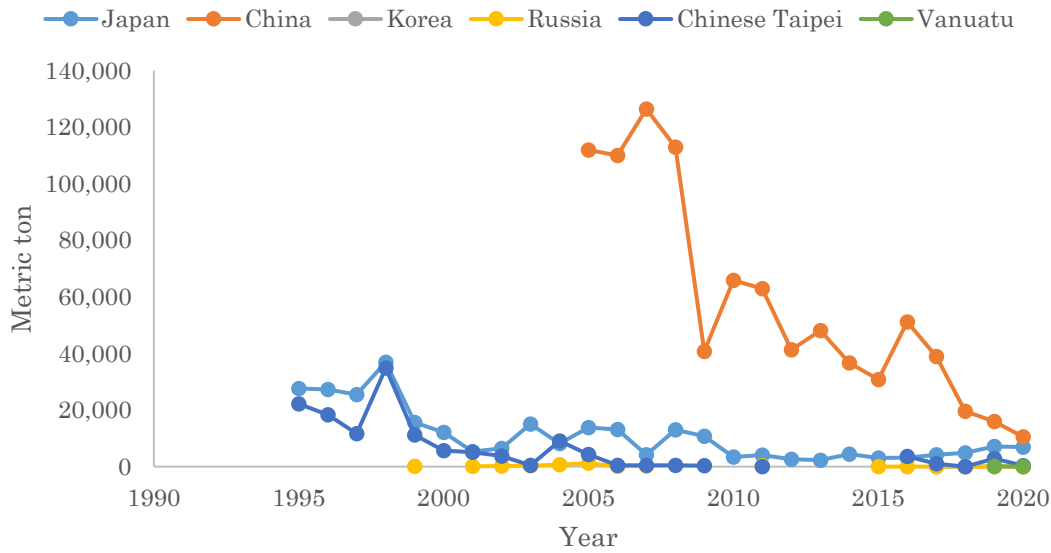


Figure 2. The historical catch of neon flying squid reported by members.

Data availability

Table 6. Data availability from Members regarding neon flying squid

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
CHINA				
Catch statistics				
Squid-jigging fisheries	Official statistics, reports from annual report	Official statistics: 2005-2019 Fishery data before 2005 (need to be confirmed)	Coverage = 100%	The neon flying squid catches are obtained from the fisheries logbook data provided by the fisheries company
Size composition data				

Length measurements	Sampling from commercial squid-jigging fishing vessels	2010-2016 Data before 2005 (need to be confirmed)	800-1000 fish/year	May lack representativeness
Aging	Sampling from commercial squid-jigging fishing vessels	2010-2016 Data before 2005 (need to be confirmed)	80-200 fish/year	May lack representativeness
Abundance indices (commercial)				
Squid-jigging fisheries	Squid-jigging logbook	1995-2019 Fishery data before 2005 (need to be confirmed)	Coverage=100%	Will conduct standardization

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
JAPAN				
Catch statistics				
Jigging fishery	Logbook	1995-2020	Coverage=100%	
Size composition data				
Length and weight measurements	Drift net survey (Summer)	1999-2020	500-600 squid/year	
	Jigging survey (Winter)	2018-2020	300-400 squid/year	
Abundance indices (survey)				

Summer survey on abundance of the autumn and winter-spring cohorts	Drift net survey CPUE for each cohort (individuals/panel)	1999-2020	20-30 stations/year	Small samples of male and matured female for the autumn cohort
Winter survey on abundance of the winter-spring cohort	Jigging survey CPUE (individuals/line)	2018-2020	12-16 stations/year	
Abundance indices (commercial)				
Jigging fishery	Logbook Standardized CPUE of the winter-spring cohort	1995-2020	Coverage=100%	Standardize CPUE for the autumn cohort

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
KOREA				
Catch statistics				
Jigging	Official statistics, reports from fisheries	2017 and 2019	Coverage =100%	
Size composition data				
Length measurements	Measured by observers while onboard	2017	3100 fish	Measurement details to be reviewed
Abundance indices (commercial)				
Jigging	Logbook data available	2017	60 set 2017	Data coverage details to be reviewed

Category and data sources	Description	Years with available data	Average sample size/year or data	Potential issues to be reviewed
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			coverage	
RUSSIA				
Catch statistics				
Drift net fishery	Official statistics, reports from fisheries associations	Official statistics: 1982-1990, 1999-2007, 2011 1985-1998, 2008-2010 and 2012-2020 (no data available); publications: 1972-2012	Coverage 1982-1984 ?%, 1999-2007, 2011 =100%	Data coverage details to be reviewed
Size composition data				
Length measurements	Sampling from commercial fishing vessels. Sampling during research surveys.	1999-2007, 2011 2012-2019	100-4,000 squids /year (ca. 50 measurements per sampling)	Data coverage details to be reviewed
Abundance indices (survey)				
Summer-autumn surveys to assess pelagic squids abundance	Upper epipelagic surveys	1984-1992, 1999-2019 (August-November)	60-80 stations/year 60-80 stations/year	Changes in abundance and migration patterns; development survey protocol and conduct standardization

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
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CHINESE TAIPEI				
Catch statistics				
Dip net fishery	Fishing gear used in different periods: 1977~1979: jigging 1980~1983: jigging and gillnet 1984~1992: gillnet 1993 till now: jigging	Data from 1977~1996 was provided by Taiwan Squid Fishery Association , data from 1997~2017 was based on logbook, and data from 2018~2020 was the statistics on landings.	Coverage 1977-1996 = ? % Coverage 1997-2017 = ? % Coverage 2017-2020 =100%	Only catch data is available before 1997.
Set net				

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
VANUATU				
Catch statistics				
squid jigging fishery	from logbook	2019	logbook from 2013 to now, coverage 100%	VU has authorized 4 vessels to conduct Pacific saury and squid jigging fishery in NPFC Convention Area. However, the vessel only targets neon flying squid by hand when they couldn't catch Pacific saury. Until now, we have only had squid catch

				information in 2019.
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Biological Information

Distribution and migration

Neon flying squid is an oceanic squid distributed in temperate and subtropical waters of the Pacific, Indian and Atlantic Oceans. The North Pacific population occurs mainly between 20° and 50°N, and comprises two cohorts: a fall cohort with a hatching period from September to February and a winter–spring cohort with a hatching period mainly from January to May, but extending to August. Neon flying squid makes an annual round-trip migration between its subtropical spawning grounds and its northern feeding grounds near the Subarctic Boundary.

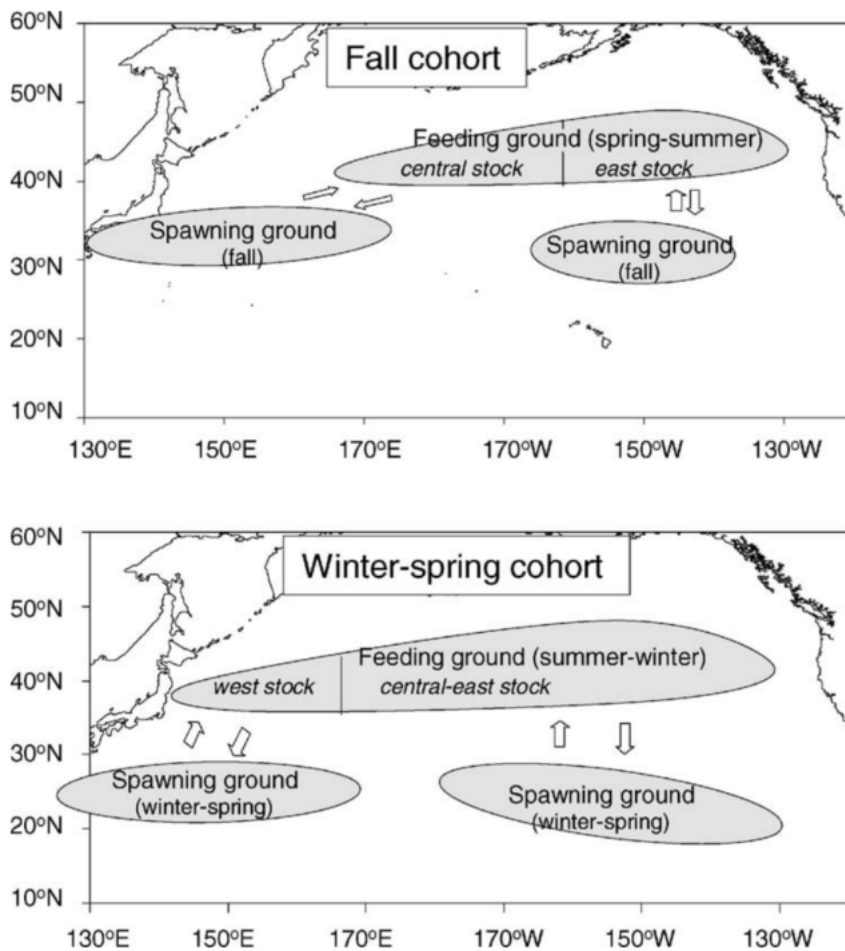


Figure 3. Migration patterns of the fall and winter–spring cohorts of neon flying squid in the North Pacific.

Life history

Growth is exponential during the first 30 days after hatching and then becomes more or less linear. It is suggested that this shift in growth accompanies a change in the feeding behavior that is thought to occur once the fused tentacles, which form a proboscis in the hatchlings, separate and become functional.

Neon flying squid at 7-10 months of age and has an estimated 1-year life span. Size at maturity is about 30–33 cm ML in males and 40–55 cm ML in females. The maximum ML is around 45 cm in males and 60 cm in females.

During its northward migration and at the feeding grounds in the central North Pacific, neon flying squid feeds mainly on fishes, squids and crustaceans. Many marine mammals feed on neon flying squid. It is an important prey of northern fur seals in the central North Pacific, and a minor prey of short-beaked common dolphins (Bower and Ichii 2005).

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Species summary for Japanese sardine

Japanese sardine (*Sardinops melanostictus*)

Common names:

拟沙丁鱼 [ni sha ding yu] (China); 마이washer [maiwashi] (Japan); 정 어 리 [jeong-eoli] (Korea); дальневосточная сардина [dalnevostochnaya sardina] (Russia); 遠東擬沙丁魚 [Yuan-Dong-Ni-Sha-Ding-Yu] (Chinese Taipei).



Figure 1. Japanese sardine (*Sardinops melanostictus*).

Management

Active NPFC Management Measures

The following NPFC conservation and management measure (CMM) pertains to this species:

- CMM 2021-11 For Japanese Sardine, Neon Flying Squid and Japanese Flying Squid

Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management Summary

The current management measure for Japanese sardine does not specify catch or effort limits. The CMM states that Members and Cooperating non-Contracting Parties currently harvesting Japanese sardine should refrain from expansion of the number of fishing vessels authorized to fish Japanese sardine in the Convention Area. New harvest capacity should also be avoided until a stock assessment has been completed.

A stock assessment for Japanese sardine is conducted by Japan within their EEZ and used for management of the domestic fishery.

Table 7. Management Summary

Convention or Management Principle	Status	Comment or Consideration
Biological reference point(s)	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	Recommended catch, effort limits
Harvest control rule	Not accomplished	Not established
Other	Intermediate	No expansion of fishing beyond established areas

Assessment

There is currently no stock assessment for Japanese sardine conducted by NPFC for the Convention Area.

Japan conducts an assessment of the Japanese sardine stock using VPA and a number of data sources described below (Nishida 2005).

Data

Surveys

Japan conducts three surveys that estimate recruitment for a number of pelagic species, including Japanese sardine (Table 2). The surveys target pre-recruits and juveniles to determine an index of recruitment. Japan also conducts a monthly egg and larval survey that is used to estimate spawning stock biomass. Surveys are conducted in spring (1995-2020), summer (2001-2020) and fall (2005-2020) at 30-80 stations per year. The survey protocol can be found at (Oozeki et al. 2007). Russia has conducted a summertime acoustic-trawl survey since 2010 that examines mid-water and upper epipelagic species including Japanese sardine.

Fishery

China, Japan and Russia catch Japanese sardine. China does not target the species, but it is captured as bycatch in other fisheries (e.g. chub mackerel). Catches are primarily by purse seine, with a smaller component of the catch taken by pelagic trawl. China's catch of Japanese sardine is taken exclusively from the Convention Area from April to December. China's existing catch records are from 2016 to 2020 and show increasing catches during that time period as the stock may have been increasing. The historical catches (prior to 2016) are unknown, thought to be low and likely need to be confirmed.

Japan's fishery for Japanese sardine occurs inside their EEZ and is mostly conducted by large purse seine vessels (>90% of the catch). Additional components of the fishery include set nets,

dip nets and other gears. The fishery experienced very high catches in the 1980's and early 1990's, a decline to very low catches from 1995 to ~2010 and has been recovering since then. The fishery is conducted year round, but mainly during the summer season.

The Russian fishery occurs inside their EEZ and is prosecuted primarily by pelagic trawling (>90% of the catch), with a smaller component of the catch coming from purse seines. The success of Russian fishery depends on the migration patterns and overall abundance of Japanese sardine, as the sardine move into Russian waters when their abundance is high. For this reason, there was no catch from 1994-2011 when the stock abundance was low, but in recent years (since 2016) as the stock has recovered and water temperatures have been warm there have been increasing catches in Russia. The Russian fishery occurs primarily from June to November.

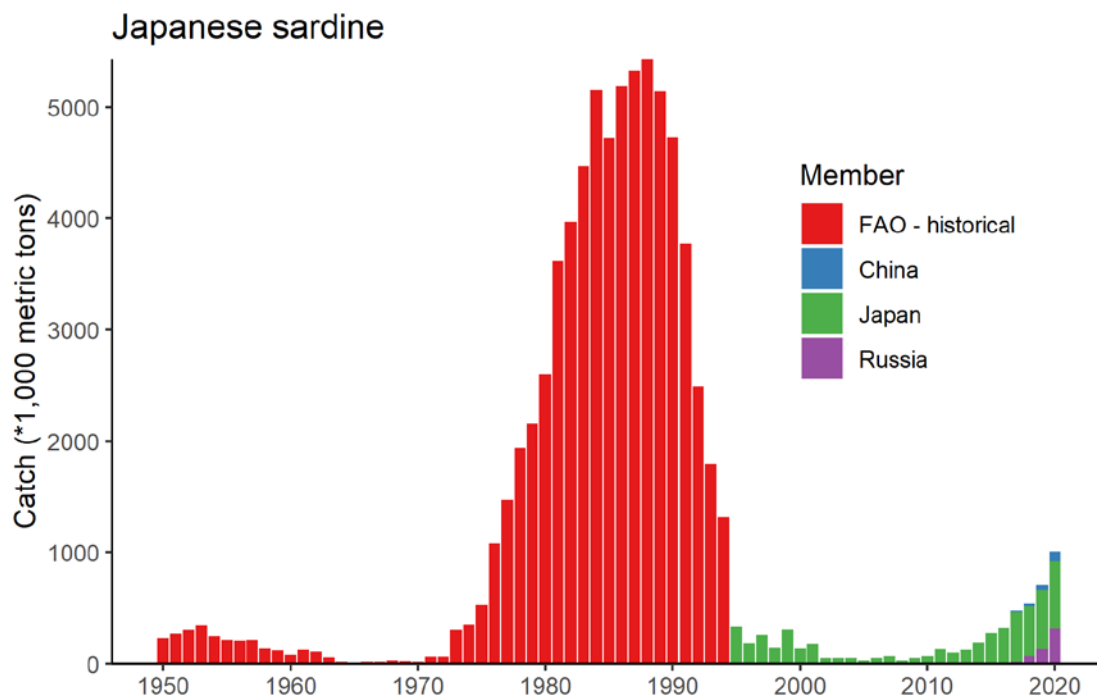


Figure 2. Historical catch of Japanese sardine.

Other NPFC Members (Canada, Korea, Chinese Taipei, USA and Vanuatu) do not target Japanese sardine. Chinese Taipei has some historical records of Japanese sardine bycatch in the Pacific Saury fishery (~100 mt) and Korea has a small amount of historical bycatch data from the bottom trawl fishery. Vanuatu, USA and Canada have no record of Japanese sardine catches.

Fishery catch data is available for Members from the NPFC website

(<https://www.npfc.int/system/files/2021-04/NPFC-2021-AR-Annual%20Summary%20Footprint%20-%20Japanese%20Sardine.xlsx>) since 2001. Prior years

fishery catch data was downloaded from FAO data collections at

<https://www.npfc.int/system/files/2021-04/NPFC-2021-AR->

[Annual%20Summary%20Footprint%20-%20Japanese%20Sardine.xlsx](#) using rfisheries package (Karthik et al., 2013).

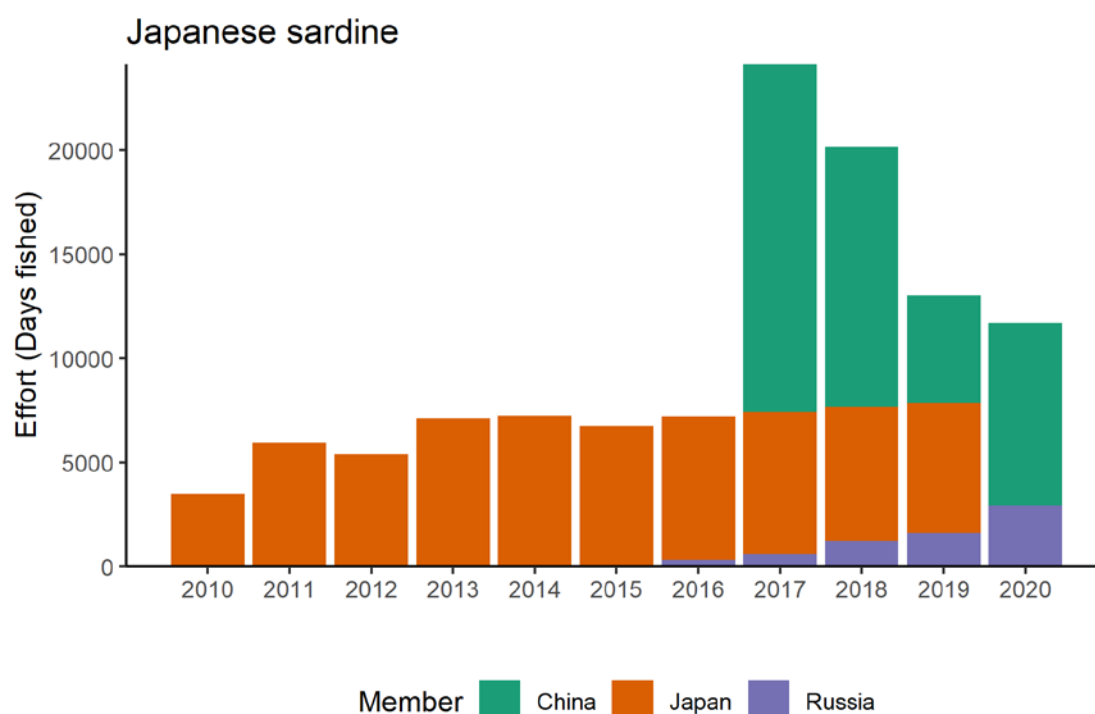


Figure 3. Historical fishing effort for Japanese sardine.

Biological collections

China collected biological data from fishery catches of Japanese sardine in 2020. These collections included length data as well as maturity and age structures.

Russia collects length and weight data, age structures (scales) and maturity data from both commercial catches and surveys.

Japan also collects length, weight, maturity and age data from the survey and fishery to support their stock assessment.

Table 8. Data availability from Members regarding Japanese sardine

Data	Source	Years	Comment
Catch	China	2016-present	Catches from convention area
	Japan	1995-present	Historical catch data from 1968 available, catches in national waters
	Korea		Minor bycatch in bottom trawl fishery
	Russia	2016-present	Catches primarily in national waters, not convention area
	Chinese Taipei		Minor bycatch in Pacific saury fishery

Data	Source	Years	Comment
CPUE			not developed
Survey	Japan		Pre-recruit survey
	Japan		Juvenile survey
	Japan		Monthly egg and larval survey
	Russia	2010-present	Acoustic-trawl survey
Age data	China	2020	Commercial catch
	Japan		Commercial and survey catches
	Russia		Commercial and survey catches
Length data	China	2020	Commercial catch
	Japan		Commercial and survey catches
	Russia		Commercial and survey catches
Maturity/fecundity	China	2020	Commercial catch
	Japan		Commercial and survey catches
	Russia		Commercial and survey catches

Special Comments

None

Biological Information

Distribution

Japanese sardine (*Sardinops melanostictus*; Figure 1) are a pelagic species that occurs in large migratory schools in the coastal waters of China, Chinese Taipei, Japan, Korea and Russia (Figure 4, Kaschner et al. 2019). They generally migrate from the south to the north during summer, returning to inshore areas in the south to spawn in the winter. Japanese sardine feed mainly on zooplankton and phytoplankton.

Life history

Japanese sardine are short-lived and fast growing, maturing early at 2-years old. Their maximum length is ~24 cm and their maximum reported age is 25 years (Whitehead 1985). Their growth rates and spawning patterns are highly influenced by the environment (Niino et al. 2021) Taxonomically, the Japanese sardine are closely related to other species around the globe including *Sardinops* from southern Africa, Australia, South America and California.

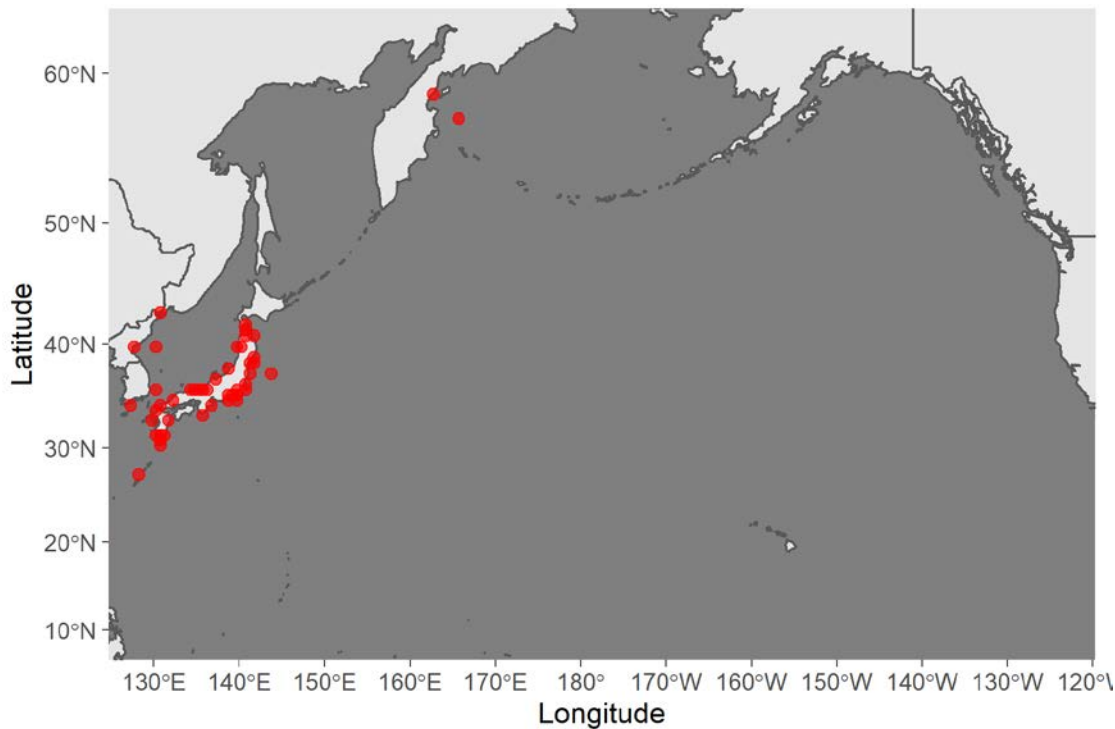


Figure 4. Map of distribution of Sardine species in the North Pacific.

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Species summary for Japanese flying squid



Japanese Flying Squid (*Todarodes pacificus*)

Common names:

太平洋褶柔鱼 [tai ping yang zhe rou yu] (Chinese); Japanese flying squid (English); スルメイカ [surume-ika] (Japanese); 살오징어 [sal-o-jing-eo] (Korean); тихоокеанский кальмар [tihookeanskiy Kalmar] (Russian); 日本魷 [ri-ben-you] (Chinese Taipei).

Other common names: Japanese common squid, Pacific flying squid.

Management

Active NPFC Management Measures

The following NPFC conservation and management measure pertains to this species:
CMM 2021-11 For Japanese Sardine, Neon Flying Squid and Japanese Flying Squid
Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management Summary

The current management measure for Japanese flying squid (JFS) does not specify catch or effort limits. The CMM states that Members and Cooperating non-Contracting Parties currently harvesting JFS should refrain from expansion of the number of fishing vessels authorized to fish JFS in the Convention Area. New harvest capacity should also be avoided until a stock assessment has been completed.

Japan has been conducting stock assessment annually for two stocks of JFS such as the Autumn- and Winter-spawning stocks since 1997. Japanese domestic total allowable catch (TAC) has been annually set for JFS based on acceptable biological catch (ABC) determined based on the stock assessment results.

Table 9. Management Summary

Convention/Management Principle	Status	Comment/Consideration
Biological reference point(s)	●	Not established.
Stock status	○	Status determination criteria not established.
Catch limit	●	Recommended catch, effort limits.
Harvest control rule	●	Not established.
Other	●	No expansion of fishing beyond established areas.

● OK ● Intermediate ● Not accomplished ○ Unknown

Stock Assessment

No stock assessment has been conducted by NPFC for the Convention Area.

Japan conducts annual stock assessments for JFS for the Autumn- and Winter-spawning stocks (Kaga et al. 2020, Kubota et al. 2020).

Data

Survey

JFS are encountered in several surveys conducted by Japan and Russia. Japanese surveys encounter multiple life history stages of one or more seasonal stocks, including larvae (winter survey), recruits (May-June), and adults. Russia conducts a survey of JFS during their feeding migration into Krill Islands waters, this results in number and biomass estimated by area swept method for Krill Islands waters (annual, for winter cohort only). While this survey captures only a portion of the stock so not fully representing stock biomass, it may help identify environmental impact on migration patterns, timing, etc.

Fishery

The winter-spawning stock of JFS is harvested in the NPFC Convention Area (see Biological Information).

JFS are caught by Members in both the Convention Area and National Waters. Catch tables are available at the NPFC website (<https://www.npfc.int/system/files/2021-07/NPFC-2021-AR-Annual%20Summary%20Footprint%20-%20Squids%20%28Rev.%20%29.xlsx>). Catches of JFS in the Convention Area are low, as the majority of catches comes from Japanese and Russian national waters (Figure 1). JFS are caught using a variety of gears, most commonly squid jigging and trawl, but purse seine and set net are also used. They are predominantly caught as a targeted species, not as bycatch in other fisheries. However, in some seasons, they can be caught as bycatch in the Japanese sardine fishery. Chinese fishing fleets do not target JFS but encounter them in low quantities as bycatch in other fisheries.

There is no fishery CPUE index developed for this species in the Convention Area. Japan has already developed fishery-dependent/independent abundance indices to use in the domestic stock assessment.

Age data are collected by port samplers from a subset of Japanese fishing ports and for several Japanese prefectural research bodies. The squid's statolith is used for counting daily ages and estimating hatching dates.

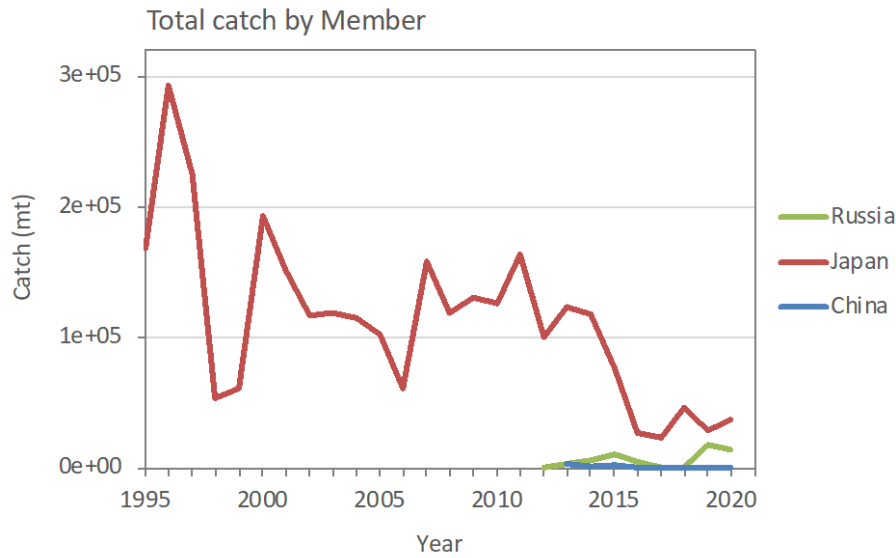


Figure 1. Total catch (mt) for each Member reporting Japanese flying squid catches during 1995-present.

Data table

Table 10. Data availability from Members regarding Japanese flying squid

Japanese flying squid: China*, Japan, Russia.

* No fishery targets Japanese flying squid. No relevant data.

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
JAPAN				
Catch statistics				
Coastal jigging fishery	Official statistics; Reports from fisheries associations and markets	1979-2020 (only after 1995 at some ports)	Coverage = 100%	
Offshore jigging fishery	Logbook	1979-2020	Coverage = 100%	

Trawl fishery	Logbook	1980-2020	Coverage = 100%	
Purse seine fishery	Official statistics; Reports from fisheries associations and markets (only at Hachinohe and Mie);	1995-2020	Coverage = 100%	
Set net	Official statistics; Reports from fisheries association	1995-2020	Coverage = 100%	
Size composition data				
Length measurements	Port sampling by eight local fisheries research bodies at major ports on the Pacific side	1979-2020	3000-15000 fish/year (about 50 individuals measured per a single size sampling)	Data coverage in the eastern Hokkaido (Nemuro Strait)
Aging	Port sampling by three local fisheries associations and nine fisheries research bodies	2012-2020	700-1400 fish/year	Data coverage in the eastern Hokkaido (Nemuro Strait)
Abundance indices (survey)				
Winter survey for larvae	BONGO net	2001-2020	65-204 stations/year	Review survey protocol and conduct standardization
Survey for recruitment from May to June	Midwater trawl	1996-2020	24-63 stations/year	Review survey protocol and conduct standardization
Survey for recruitment in June	Jigging	1972-2020	25-83 stations/year	Review survey protocol and conduct standardization

Survey for recruitment from June to July	Midwater trawl mainly targeting saury	2001-2020	33-136 stations/year	Review survey protocol and conduct standardization
Survey for recruitment in July	Midwater trawl	2018-2020	28-39 stations/year	Short time series (three years)
Survey for recruitment in August	Jigging	1979-2020	28-66 stations/year	Review survey protocol and conduct standardization

Abundance indices (commercial)

Coastal jigging fishery	Monthly catch and effort data reported by fisheries associations and markets in the seven major regions during fishing season from July to December; Standardized CPUE for domestic stock assessment	1979-2020	25-37 observations/year	
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Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
RUSSIA				
Catch statistics				
Jigging fishery	Official statistics, reports from fisheries associations	Official statistics: 1964-1970, 2013-2020, 1971-2012	Coverage 1964-1970 ?%; Coverage 2013-2020	Data coverage details to be reviewed
Midwater trawl fishery		(no data	=100%	

		available); publications: 1967-2018		
Size composition data				
Length measurements	Sampling from commercial fishing vessels. Sampling during research surveys.	1966-1975 1992-2020	500-3,000 squids /year (ca. 50 measurements per sampling)	Data coverage details to be reviewed
Aging	-	-	-	-
Catch at age (CAA)	-	-	-	-
Abundance indices (survey)				
Summer trawl and acoustic (echointegration) surveys to assess pelagic squids abundance	Mid-water upper epipelagic surveys	1992-2020 (June-July) 1992-2020 (July-August)	60-80 stations/year 60-80 stations/year	Changes in abundance and migration patterns; development survey protocol and conduct standardization

Biological Information

Distribution and migration

JFS are distributed mainly in the northwest Pacific (Fig. 2) and their northward/southward shifts in distribution range occur in response to changes in water temperature (Sakurai et al. 2013). JFS extent their distribution up to 50° N in September. There are northmost (eastmost) and southmost occurrences recorded in Canada and Hong Kong, respectively (Cuttlefishes and Squids of the World, FAO.org).

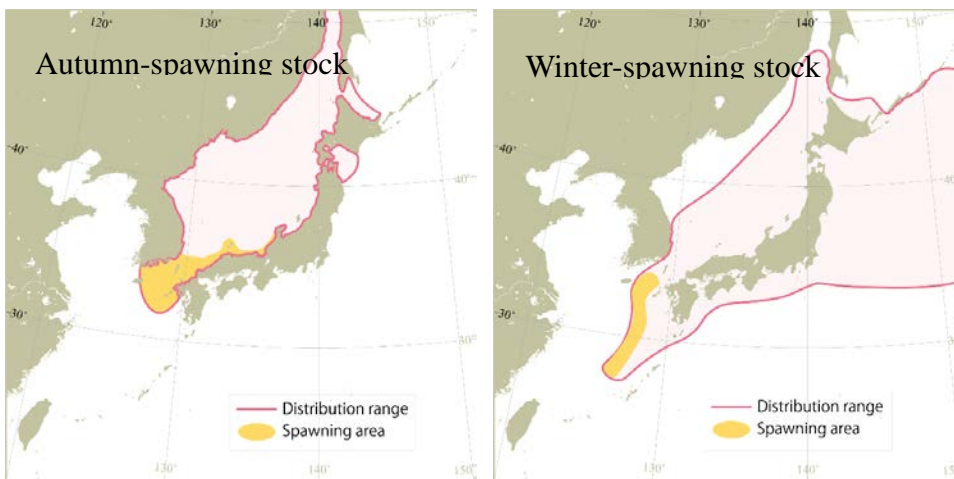


Figure 2. Distribution ranges and spawning areas of autumn- and winter-spawning stocks. These figures were modified based on Kubota et al. (2020) and Kaga et al. (2020).

Stock Structure

There are distinct sub-populations (stocks) which spawn during different seasons (FAO.org, Sakurai et al. 2013). An autumn-spawning stock is most abundance, followed by a winter-spawning stock which is distributed in the waters off eastern Japan Oyashio region (Sakurai et al. 2013, Kaga et al. 2020, Kubota et al. 2020). There is, in addition, minor stock of spring/summer spawned squid.

Life history

Maximum size thought to be 50 cm (mantle length) for females, smaller for males. Females are thought to mature around 20-25 cm (mantle length). The JFS lifespan is approximately one year (FAO.org). According to FAO, JFS prey on myctophids, anchovies, crustaceans, gastropod larvae, and chaetognaths, and are preyed upon by rays and several marine mammals.

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Species summary for blue mackerel



Blue mackerel (*Scomber australasicus*)

Common names:

澳洲鲈 [ao-zhou-tai] (Chinese), ゴマサバ [gomasaba] (Japanese), 망치고등어 [Mang-chi-go-deung-eo] (Korean), пятнистая скумбрия [pyatnistaya skumbriya] (Russian), 花腹鯖 [Hua-Fu-Ching] (Chinese Taipei).

Other common names: Spotted mackerel.

Management

Active NPFC Management Measures

None

Management Summary

- ✓ Conservation and Management Measure has not been set for blue mackerel in the NPFC.
- ✓ In Japan, total allowable catch (TAC) has been introduced to management of mackerels (blue mackerel and chub mackerel) since 1997.

Table 11. Management Summary

Convention/Management Principle	Status	Comment/Consideration
Biological reference point(s)	●	Not established.
Stock status	○	Status determination criteria not established.
Catch limit	●	Recommended catch, effort limits.
Harvest control rule	●	Not established.
Other	●	No expansion of fishing beyond established areas.

● OK
 ● Intermediate
 ● Not accomplished
 ○ Unknown

Stock Assessment

- ✓ No stock assessment has been conducted by NPFC.
- ✓ Japan conducts stock assessments on the Pacific stock and the East China Sea stock of blue mackerel using VPA (Yukami et al. 2019a, 2019b). Only the Pacific stock is distributed in the NPFC convention area.

Data

Survey

Japan conducts three surveys: (1) egg and larval distribution survey (every month, Fig. 1), (2) juvenile survey (May-Jul from 2001), and (3) pre-recruit fish survey (Aug-Oct from 2001). Other members do not conduct any survey on blue mackerel.

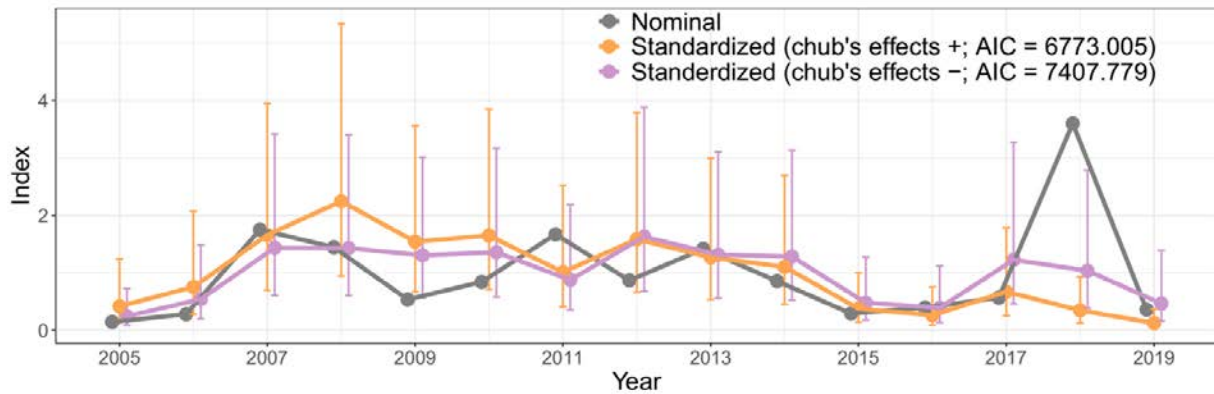


Figure 1. Time series of egg abundance index. Nominal index and two standardized indices one of which incorporate the effect of misidentification to chub mackerel (chub's effect +) and the other not (chub's effect -) are shown. See Kanamori et al. (2021) for details.

Fishery

The fishing grounds of Japanese fisheries are located in the water on continental shelves and slopes, around water of Islands within Japan's EEZ. The primary fishing gears of Japan are purse-seine (large-scale >40GRT and small-scale <40GRT vessels), set net and dip net. In the 1980s, blue mackerel were caught mostly by dip net. From the 1990s, large- and small-scale purse-seine fisheries dominated the catch. The blue mackerel catch has decreased since 2010s and remains at low levels in recent years (Fig. 2). Chub and blue mackerels are caught together by the fisheries and summed together as "mackerels" in fishery statistics of Japan. The blue mackerel catch was estimated from the mixing ratio survey of landing. Japan conducts the identification of each species by external form; blue mackerel has clear black spots on both sides of body, and the interval between splines of first dorsal fin of blue mackerel is narrower than that of chub mackerel.

China operates a blue mackerel fishery in the NPFC Convention Area only, on the same fishing grounds as for chub mackerel. The portion of blue mackerel is about 10% of the catch, although it varies from year to year. China takes samples to determine the composition of mackerel species in the catch and collects biological information.

In Russia, there are no accurate catch statistics on the proportion of blue and chub mackerels. However, the portion of blue mackerel is very small and probably comprises less than 1% of the total mackerel catch by Russia.

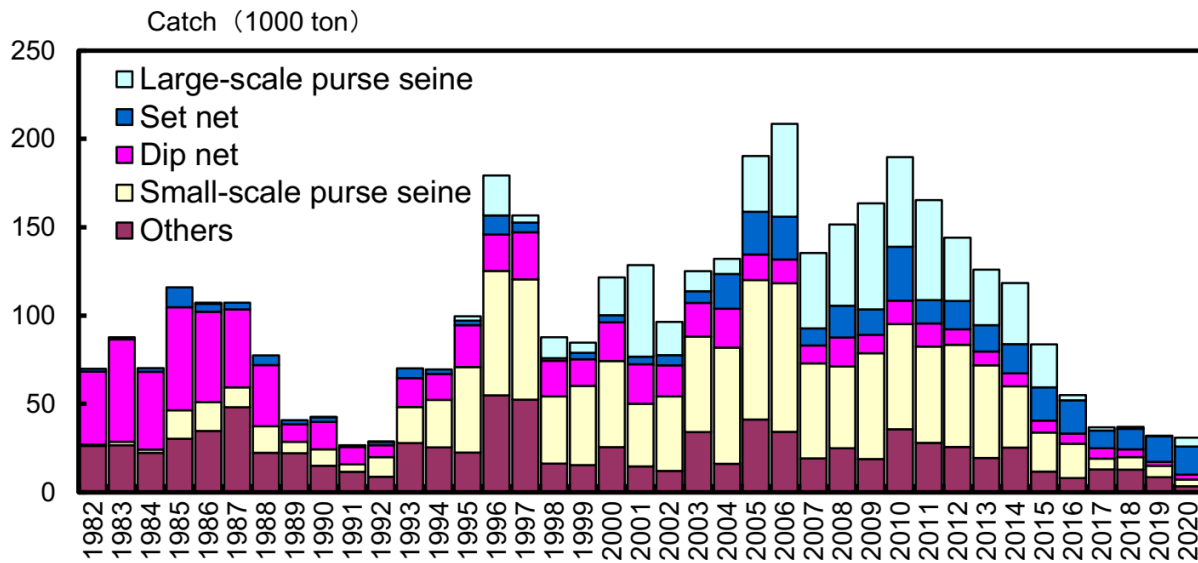


Figure 2. Catch weight by fishery from 1982 to 2020 in Japan.

Data table

Data availability tables which include information about catch, abundance indices and biological data from China and Japan are respectively shown below (Tables 2, 3). For Russia, no relevant data are available.

Table 2. Data availability table from China.

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
CHINA				
Catch statistics				
Purse seine fishery Trawl fishery	Official statistics, reports from annual report	Official statistics: 2015-2020	Coverage=100 %	The spotted mackerel and Japanese sardine catches are from the fishing catch provided by the fishery company
Size composition data				
Length measurements	Port sampling by Institute and	2016-2020	550-800 fish/year	Details to be reviewed

	technology group.			
Aging	Sampling during research surveys and from commercial fishing vessels	2019-2020	30-180 fish/year	Details to be reviewed
Catch at age (CAA)	Estimate CAA from the above data	2016-2020	Age-length keys are to be developed	Evaluate uncertainty of catch at age, especially on changes of growth depending on recruitment abundance
Abundance indices (commercial)				
Purse seine fishery	Purse seine logbook	2015-2020	10-60/year	Will conduct standardization

Table 3. Data availability table from Japan.

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
JAPAN				
Catch statistics				
Purse seine fishery	Official statistics; reports from fisheries associations and markets	Official statistics: 1950-2020, other reports: 1982-2020	Coverage=100 %	The spotted mackerel catches are estimated from chub and spotted mackerel catches based on port sampling data
Dip net fishery				
Set net				
Size composition data				

Length measurements	Port sampling by 17 local fishery institutes in 17 prefectures	1995-2020	4,000-40,000 (average 10,000) fish/year (ca. 100 measurements per sampling)	Data coverage review
Aging	Port sampling by 17 local fishery institutes in 17 prefectures	1995-2020	500-1000 fish/year	Data coverage review
Catch at age (CAA)	CAA is estimated with length measurement and aging data	1995-2020	Age-length keys are created approximately by quarter and local regions	Evaluation of uncertainty in catch at age, especially on changes in growth depending on recruitment abundance
Abundance indices (survey)				
Year-round for egg density	Almost all local fisheries research bodies join this survey program. NORPAC net is sampling gear. This survey is conducted for small pelagic species.	2005-2020	ca. 6000 stations in total, 1000-4000 stations with spotted mackerel eggs/year	Review survey protocol and conduct standardization
Abundance indices (commercial)				
Dip net fishery	Logbook data are collected from fishermen in Shizuoka prefecture since 1995	1995-2020	100-500/year	Standardization

Special Comments

Although the Small Working Group (SWG) used ‘spotted mackerel’ as the common name of this species, the SWG recommended to SC to change the common name to ‘blue mackerel’ for consistency with the FAO database of fish species.

Catch statistics specific to blue mackerel in the NPFC Convention Area are not available because combined catch of chub and blue mackerels have been reported to NPFC (<https://www.npfc.int/summary-footprint-chub-mackerel-fisheries>). Separation of chub and blue mackerels in catch data including historical data will be necessary for a stock assessment by NPFC.

Biological Information

The below descriptions are extracted from Yukami et al. (2019b).

Distribution and migration

Blue mackerel tends to distribute in warm offshore waters. The main distribution area for adults is around water of the Kuroshio current. The distribution and migration are shown in Fig. 3.

The larvae hatch around the Kuroshio current and are distributed from the coastal water of southern Honsyu to the transition water between Kuroshio and Oyashio currents located 165 to 170 East longitude, the same as the chub mackerel larvae. The juveniles sized at 5 to 15cm fork length (FL) transferred to transition water, migrate to north as they grow, feed at the area from coastal water of eastern Hokkaido and Kurill Islands to the subarctic water around 165 degree East longitude where the surface temperature around 13°C in summer to fall. They reach 20 to 25cm FL in fall to winter, and migrate south to the coastal waters of Joban and Boso to offshore water around Kuroshio current for wintering. A wintering ground in the water near Emperor Seamounts was observed for 2004 year class which had high recruitment. Age 1 fish did not appear in the water north of Sanriku district after wintering until 1980, but they have migrated to the water from Tohoku to Hokkaido with the increase of surface temperature since 2001. They return south for wintering and migrate to the Izu Islands water for spawning in spring. Many schools distribute near Kuroshio current at the coastal water of southern Honshu all the year and are targeted by many fisheries. These are different from the schools that largely migrate from near the Kuroshio current at the Izu Island to Tohoku and Hokkaido waters. It is suggested that many fish above age 3 do not migrate north of Sanriku district and stay at the western water near the cape Ashizuri with small migrations or stay near the spawning grounds. Furthermore, it is considered that the observation of schools mainly consisting of age 8 fish at the Emperor seamounts area in 2008 to 2015 were due to the dominant recruitment spawned at the water south of Hachijo Island.

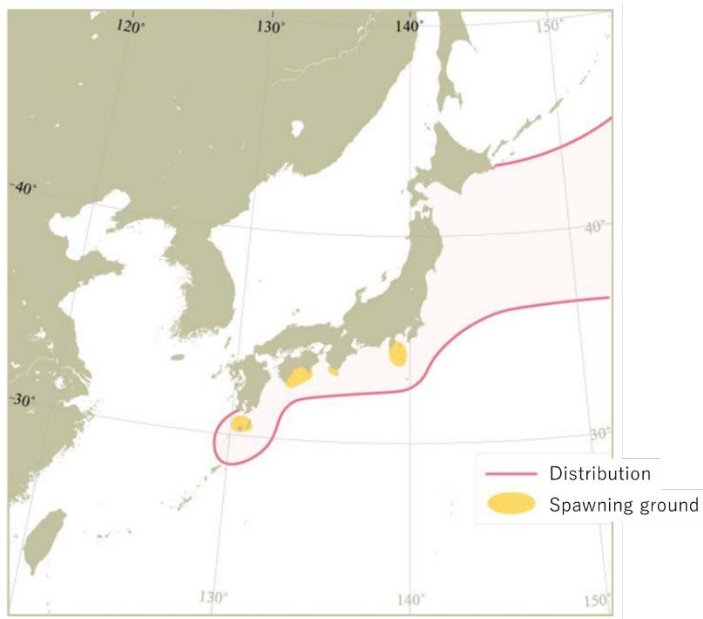


Figure 3. Distribution and spawning ground of the Pacific stock of blue mackerel.

Age and growth

The larvae grow 1mm per day until 5cm FL after hatching observed by otolith reading, then it grows 15cm after 80days, and over 20cm of 120 days after hatching. The scale annuli reading is practical for the fish after subadult stage, it is used for the survey. Otolith annuli and daily ring readings are also effective for age determination. Recent analysis for age and growth from sampling of catch indicates fish becoming 20-25cm FL at age 0 in fall, 28-31cm at age 1 in summer, 30-34cm at age 2, 33-36cm at age 3, around 37cm at age 4, and 45cm at the maximum. The longevity was estimated around age 6 from size composition of catch, but the oldest age 11 was reported. The growth at younger ages is different by area, and in the western area of offshore Kumano there is a tendency for faster growth than fish occur in the water north of Izu Islands. The average length (FL), weight (average weight in catch in 2014 to 2018) by age are shown in Fig. 4.

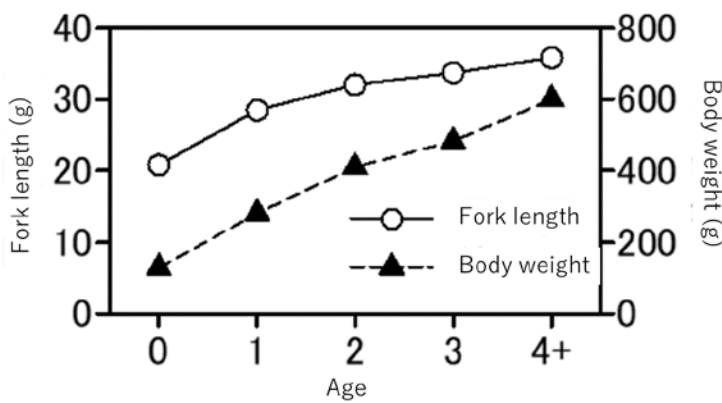


Figure 4. Relationship between age and fork length and relationship between age and body weight of blue mackerel.

Reproduction

The blue mackerel mature and spawn above 30cm FL from the observation of ovary tissue. The mature age was considered age 2 and above and it is assumed that all the fish age 2 and above are mature and spawn (Figs. 4, 5). The spawning grounds are found from the waters southern Kyusyu and cape Ashizuri to the Kuroshio current water near Izu Islands (Fig3). The recruitments hatched at the larger spawning ground in the East China sea supposed to migrate into the Pacific water. A spawning season are from December to June next year at the western waters of cape Ashizuri, January to March in the East China sea, and February to March near the water of cape Ashizur. The spawning season of main spawning ground of blue mackerel near Izu Island are March to June, but it considered that it is not suitable as spawning grounds by the short spawning season from the ovary tissue observation and small amount of spawning eggs sampled. However, it is supposed that larvae and juvenile occurring in the north of transition area consist of the fish hatched at the Izu Island spawning grounds in March to June, same as chub mackerel.

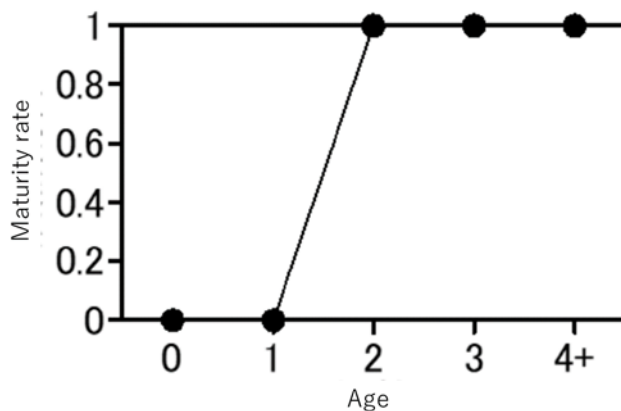


Figure 5. Maturity rate by age.

Predator-prey relationship

Larvae feed on planktonic crustaceans and larvae of anchovy or sardines. Juveniles feed on small teleost and cephalopods with preys mentioned above. It preys on fishes including anchovy, benttooth and lantern fishes, crustaceans like krill and cephalopods at the Kumano Nada fishing ground, horned krill and anchovy at Sanriku fishing ground and copepod, krill, anchovy, lantern fishes, cephalopod like Enoploteuthidae and salpa in the transition area between Kuroshio and Oyashio where located offshore of Joban and Sanriku. Predation on blue mackerel by whales is observed during periods of high abundance.

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Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean

CMM 2021-05

(Entered into force 10 July 2021)

**CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE
ECOSYSTEMS IN THE NORTHWESTERN PACIFIC OCEAN**

The North Pacific Fisheries Commission (NPFC),

Strongly supporting protection of vulnerable marine ecosystems (VMEs) and sustainable management of fish stocks based on the best scientific information available;

Recalling the United Nations General Assembly Resolutions (UNGA) on Sustainable Fisheries, particularly paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, and paragraphs 69 and 80 to 91 of UNGA61/105 in 2006;

Noting, in particular, paragraphs 66 and 69 of UNGA59/25 that call upon States to take action urgently to address the issue of bottom trawl fisheries on VMEs and to cooperate in the establishment of new regional fisheries management organizations or arrangements;

Recognizing further that fishing activities, including bottom fisheries, are an important contributor to the global food supply and that this must be taken into account when seeking to achieve sustainable fisheries and to protect VMEs;

Recognizing the importance of collecting scientific data to assess the impacts of these fisheries on marine species and VMEs;

Concerned about possible adverse impacts of unregulated expansion of bottom fisheries on marine species and VMEs in the western part of the Convention Area.

Adopts the following Conservation and Management Measure:

1. Scope

A. Coverage

These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northwestern Pacific Ocean, defined, for the purposes of this document, as those occurring in the Convention Area as set out in Article 4 of the Convention text to the west of the line of 175 degrees W longitude (here in after called “the western part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

B. Management target

Bottom fisheries conducted by vessels operating in the western part of the Convention Area.

2. General purpose

Sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area.

The objective of these Measures is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur.

These measures shall set out to prevent significant adverse impacts on VMEs in the Convention Area of the North Pacific Ocean, acknowledging the complex dependency of fishing resources and species belonging to the same ecosystem within VMEs.

The Commission shall re-evaluate, and as appropriate, revise, the definition based on further consideration of the work done through FAO and by NPFC.

3. Principles

The implementation of this CMM shall:

- (a) be based on the best scientific information available,
- (b) be in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
- (c) establish appropriate and effective conservation and management measures,
- (d) be in accordance with the precautionary approach, and
- (e) incorporate an ecosystem approach to fisheries management.

4. Measures

Members of the Commission shall take the following measures in order to achieve sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area:

- A. Limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
- B. Not allow bottom fisheries to expand into the western part of the Convention Area where no such fishing is currently occurring, in particular, by limiting such bottom fisheries to seamounts located south of 45 degrees North Latitude and refrain from bottom fisheries in other areas of the western part of the Convention Area covered by these measures and also not allow bottom fisheries to conduct fishing operation in areas deeper than 1,500m.
- C. Notwithstanding subparagraphs A and B above, exceptions to these restrictions may be provided in cases where it can be shown that any fishing activity beyond such limits or in any new areas would not have significant adverse impacts (SAIs) on marine species or any VME. Such fishing activity is subject to an exploratory fishery protocol (Annex 1).
- D. Any determinations pursuant to subparagraph C that any proposed fishing activity will not have SAIs on marine species or any VME are to be in accordance with the Science-based Standards and Criteria (Annex 2), which are consistent with the FAO International Guidelines for the Management of Deepsea Fisheries in the High Seas.
- E. Any determinations, by any flag State or pursuant to any subsequent arrangement for the management of the bottom fisheries in the areas covered by these measures, that fishing activity would not have SAIs on marine species or any VMEs, shall be made publicly available through agreed means.
- F. Prohibit its vessels from engaging in directed fishing on the following taxa: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia* as well as any other indicator species for VMEs as may be identified from time to time by the SC and approved by the Commission.
- G. Further, considering accumulated information regarding fishing activities in the western part of the Convention Area, in areas where, in the course of fishing operations, cold

water corals more than 50Kg are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 2 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species, shall be reported to the Secretariat, through the Member, within one business day. The Executive Secretary ~~who~~ shall, within one business day, immediately notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit bottom fishing vessels from contacting the sea floor with their trawl nets, so that appropriate measures can be adopted in respect of the relevant site. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the cold water corals include: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*.

Gbis Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.

- H. C-H seamount and Southeastern part of Koko seamount, specifically for the latter seamount, the area South of 34 degrees 57 minutes North, East of the 400m isobaths, East of 171 degrees 54 minutes East, North of 34 degrees 50 minutes North, are closed precautionary for potential VME conservation. Fishing in these areas requires exploratory fishery protocol (Annex 1).
- I. Ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm.
- J. Apply a bottom fisheries closure from November to December.
- K. Limit annual catch of North Pacific armorhead to 15,000 tons for Japan.

- L. Development of new fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members without documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area shall be determined in accordance with relevant provisions, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.
- M. In years when strong recruitment of North Pacific armorhead is not detected (Annex 6), the Commission encourages Japan to limit the annual catch of North Pacific armorhead by vessels flying its flag to 500 tons, and encourages Korea to limit the annual catch of North Pacific armorhead by vessels flying its flag to 200 tons. The Commission encourages that catch overages for any given year be subtracted from the applicable annual catch limit in the following year, and that catch underages during any given year not be added to the applicable annual catch limit during the following year.
- N. Notwithstanding subparagraph K, when a strong recruitment of North Pacific armorhead is detected through the monitoring surveys as specified in Annex 6, the Commission encourages that Japan limit the annual catch of North Pacific armorhead by vessels flying its flag to 10,000 tons, and that Korea limit the annual catch of North Pacific armorhead by vessels flying its flag to 2,000 tons. The Commission encourages that catch overages for any given year be subtracted from the applicable annual catch limit in the following year, and that catch underages during any given year not be added to the applicable annual catch limit during the following year. During a year when high recruitment is detected, bottom fishing with trawl gear shall be prohibited in specific areas in the Emperor seamounts where half of the catch occurred in 2010 and 2012 (Annex 6). Determination of a strong recruitment year and of the specific areas where bottom fishing with trawl gear is prohibited shall be communicated to all Members and Cooperating Non-Contracting Parties following the procedure specified in Annex 6.
- O. Catch in the monitoring surveys shall not be included in the catch limits specified in paragraphs M and N but shall be reported to the Secretariat.
- P. Fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members with documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area is not precluded.

- Q. Members shall require vessels flying their flags to use trawl nets with mesh size greater than or equal to 130mm of stretched mesh with 5kg tension in the codend when conducting fishing activities for North Pacific armorhead or splendid alfonsino.
- R. Task the Scientific Committee with reviewing the appropriate methods for establishing catch limits, and the adequacy and practicability of the adaptive management plan described in subparagraphs K, L, M, N, O, P, Q and Annex 6 from time to time and recommending revisions and actions, if necessary.
- S. Prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets in the following two sites with VME indicator species. A Member of the Commission whose fishing vessels entered these areas shall report to the TCC as to how it ensured the compliance of this measure.

Sites with VME indicator species (Areas surrounded by the straight lines linking the 4 geographical points below)

Northwestern part of Koko Seamount	35-44.75 N 171-07.60 E	35-44.75 N 171-07.80 E
	35-43.80 N 171-07.80 E	35-43.80 N 171-08.00 E
Northern Ridge of Colahan Seamount	31-03.85 N 175-53.40 E	31-03.85 N 175-53.65 E
	31-03.5 N 175-53.50 E	31-03.05 N 175-53.85 E

5. Contingent Action

Members of the Commission shall submit to the SC their assessments of the impacts of fishing activity on marine species or any VMEs, including the proposed management measures to prevent such impact. Such submissions shall include all relevant data and information in support of any such assessment. Procedures for such reviews including procedures for the provision of advice and recommendations from the SC to the submitting Member are attached (Annex 3). Members will only authorize bottom fishing activity pursuant to para 4 (C).

6. Scientific Information

To facilitate the scientific work associated with the implementation of these measures, each Member of the Commission shall undertake:

A. Reporting of information for purposes of defining the footprint

In implementing paragraphs 4A and 4B, the Members of the Commission shall provide for each year, the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, and areas fished (names of

seamounts) to the Secretariat. The Secretariat shall circulate the information received to the other Members consistent with the approved Regulations for Management of Scientific Data and Information. To support assessments of the fisheries and refinement of conservation and management measures, Members of the Commission are to provide updated information on an annual basis.

B. Collection of information

(i) Collection of scientific information from each bottom fishing vessel operating in the western part of the Convention Area.

(a) Catch and effort data

(b) Related information such as time, location, depth, temperature, etc.

(ii) As appropriate, the collection of information from research vessels operating in the western part of the Convention Area.

(a) Physical, chemical, biological, oceanographic, meteorological, etc.

(b) Ecosystem surveys.

(c) Seabed mapping (e.g. multibeam or other echosounder); seafloor images by drop camera, remotely operated underwater vehicle (ROV) and/or autonomous underwater vehicle (AUV).

(iii) Collection of observer data

Duly designated observers from the flag member shall collect information from bottom fishing vessels operating in the western part of the Convention Area. Observers shall collect data in accordance with Annex 5. Each Member of the Commission shall submit the reports to the Secretariat in accordance with Annex 4. The Secretariat shall compile this information on an annual basis and make it available to the Members of the Commission.

7. Control of bottom fishing vessels

To strengthen its control over bottom fishing vessels flying its flag, each Member of the Commission shall ensure that all such vessels operating in the western part of the Convention Area be equipped with an operational vessel monitoring system.

8. Observers

All vessels authorized to bottom fishing in the western part of the Convention Area shall carry an observer on board.

Annex 1

EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.
2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:
 - (i) precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
 - (ii) precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
 - (iii) regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
 - (iv) measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
 - (v) comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.
3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:
 - (i) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.
 - (ii) The assessment in (i) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.
 - (iii) The SC is to review the information and the assessment submitted in (i) above in accordance with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”
 - (iv) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the

basis of comments and recommendations of SC. Any determinations, by any Member of the Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.
5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.
6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.
7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.
- 7.8. The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4(1)(a).

Appendix 1.1

Information to be provided before exploratory fisheries start

1. A harvesting plan
 - Name of vessel
 - Flag member of vessel
 - Description of area to be fished (location and depth)

- Fishing dates
- Anticipated effort
- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

2. A mitigation plan

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

3. A catch monitoring plan

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

4. A data collection plan

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

Appendix 1.2

Information to be included in the report

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES

1. Introduction

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

2. Purpose

- (1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities¹ on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the Commission.
- (2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as follows:
 - (a) The fisheries are conducted in the Convention Area;

¹ “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.

- (b) The total catch (everything brought up by the fishing gear) includes species that can only sustain low exploitation rates; and
- (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations.

3. Definition of VMEs

- (1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold-water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.
- (2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).
- (3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.
 - (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
 - (i) Habitats that contain endemic species;
 - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
 - (iii) Nurseries or discrete feeding, breeding, or spawning areas.
 - (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.
 - (c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities
 - (d) Life-history traits of component species that make recovery difficult – ecosystems

that are characterized by populations or assemblages of species with one or more of the following characteristics:

- (i) Slow growth rates
 - (ii) Late age of maturity
 - (iii) Low or unpredictable recruitment
 - (iv) Long-lived
- (e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.
- (4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. That is, whether the ecological unit is the entire Area, or the current fishing ground, namely, the Emperor Seamount and Northern Hawaiian Ridge area (hereinafter called “the ES-NHR area”), or a group of the seamounts within the ESNHR area, or each seamount in the ES-NHR area, is to be decided using the above criteria.

4. Identification of potential VMEs

(1) Fished seamounts

(a) Identification of fished seamounts

It is reported that four types of fishing gear are currently used by the members of the Commission in the ES-NHR area, namely, bottom trawl, bottom gillnet, bottom longline and pot. A fifth type of fishing gear (coral drag) was used in the ES-NHR area from the mid-1960s to the late 1980s and is possibly still used by non-members of the Commission. These types of fishing gear are usually used on the top or slope of seamounts, which could be considered VMEs. It is therefore necessary to identify the footprint of the bottom fisheries (fished seamounts) based on the available fishing record. The following seamounts have been identified as fished seamounts: Suiko, Showa, Youmei, Nintoku, Jingu, Ojin, Northern Koko, Koko, Kinmei, Yuryaku, Kammu, Colahan, and CH. Since the use of most of these gears in the ES-NHR area dates back to the late 1960s and 1970s, it is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may be physically unsuitable for certain fishing gears. Thus, it is important to know

actual fished areas within the same seamount so as to know the gravity of the impact of fishing activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

5. Assessment of SAIs on VMEs or marine species

(1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.

(2) When determining the scale and significance of an impact, the following six factors are to be considered:

- (a) The intensity or severity of the impact at the specific site being affected;
- (b) The spatial extent of the impact relative to the availability of the habitat type affected;
- (c) The sensitivity/vulnerability of the ecosystem to the impact;
- (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;

- (e) The extent to which ecosystem functions may be altered by the impact; and
- (f) The timing and duration of the impact relative to the period in which a species needs the habitat during one or more life-history stages.

(3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

(4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.

(5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:

- (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
- (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
- (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;
- (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
- (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
- (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.

(6) Impact assessments are to consider, as appropriate, the information referred to in these Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.

(7) Where an assessment concludes that the area does not contain VMEs or that

significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

Annex 2.1

Examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which may contribute to forming VMEs:	
a.	certain cold-water corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), black corals (antipatharia), and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyphores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and
d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities referred to above:

- a. submerged edges and slopes (e.g., corals and sponges)
- b. summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges and xenophyphores)
- c. canyons and trenches (e.g., burrowed clay outcrops, corals),
- d. hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
- e. cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

Annex 2.2

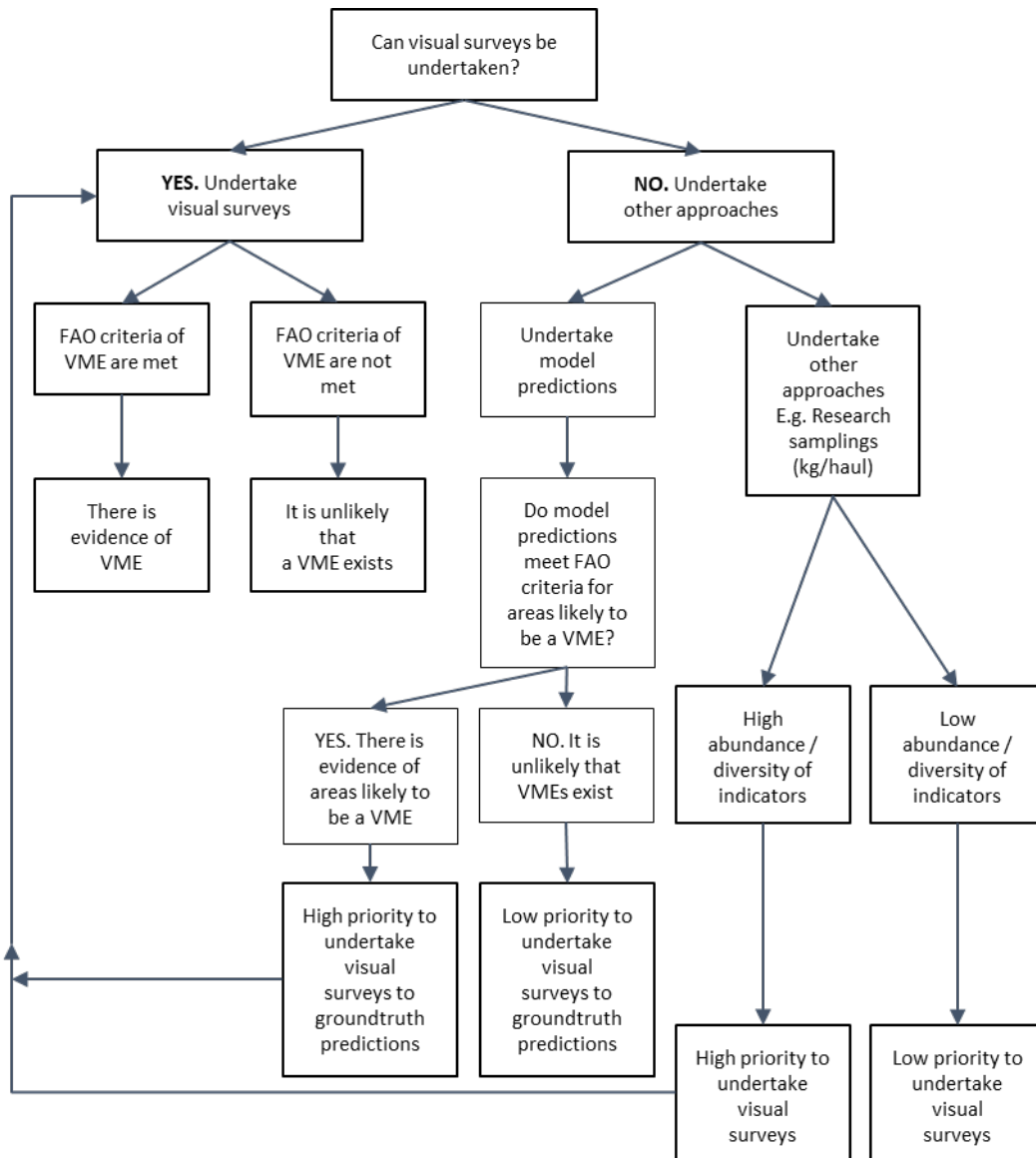
Template for reports on identification of VMEs and assessment of impacts caused by individual fishing activities on VMEs or marine species

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)
3. Status of the fishery (existing fishery or exploratory fishery)
4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)
 - (1) Number of fishing vessels

- (2) Tonnage of each fishing vessel
- (3) Number of fishing days or days on the fishing ground
- (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots per day for pot, total length of net per day for gillnet)
- (5) Total catch by species
- (6) Names of seamounts fished or to be fished
7. Fishing period
8. Analysis of status of fishery resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
9. Analysis of status of bycatch species resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
10. Analysis of existence of VMEs in the fishing ground
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species
12. Other points to be addressed
13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).

Annex 2.3

Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



**SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM
FISHING ACTIVITIES**

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch Data: Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- Length Frequency Data: Number of fish measured per species, by area and season.
- Biological Data: Type and quantity of other biological data or samples (otoliths, sex, maturity, etc.) collected per species.

- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Detection of Fishing in Association with Vulnerable Marine Ecosystems

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

E. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

F. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

NPFC BOTTOM FISHERIES OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
 - (a) NPFC vessel ID.
 - (b) Observer's name.
 - (c) Observer's organisation.
 - (d) Date observer embarked (UTC date).
 - (e) Port of embarkation.
 - (f) Date observer disembarked (UTC date).
 - (g) Port of disembarkation.

B. Catch & Effort Data to be collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - (a) Tow start date (UTC).
 - (b) Tow start time (UTC).
 - (c) Tow end date (UTC).
 - (d) Tow end time (UTC).
 - (e) Tow start position (Lat/Lon, 1 minute resolution).
 - (f) Tow end position (Lat/Lon, 1 minute resolution).
 - (g) Type of trawl, bottom or mid-water.
 - (h) Type of trawl, single, double or triple.
 - (i) Height of net opening (m).
 - (j) Width of net opening (m).
 - (k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
 - (l) Gear depth (of footrope) at start of fishing (m).
 - (m) Bottom (seabed) depth at start of fishing (m).
 - (n) Gear depth (of footrope) at end of fishing (m).
 - (o) Bottom (seabed) depth at end of fishing (m).

- (p) Status of the trawl operation (no damage, lightly damaged*, heavily damaged*, other (specify)).
*Degree may be evaluated by time for repairing (≤ 1 hr or > 1 hr).
- (q) Duration of estimated period of seabed contact (minute)
- (r) Intended target species.
- (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- (t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
 - (a) Set start date (UTC).
 - (b) Set start time (UTC).
 - (c) Set end date (UTC).
 - (d) Set end time (UTC).
 - (e) Set start position (Lat/Lon, 1 minute resolution).
 - (f) Set end position (Lat/Lon, 1 minute resolution).
 - (g) Net panel (“tan”) length (m).
 - (h) Net panel (“tan”) height (m).
 - (i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - (j) Bottom depth at start of setting (m).
 - (k) Bottom depth at end of setting (m).
 - (l) Number of net panels for the set.
 - (m) Number of net panels retrieved.
 - (n) Number of net panels actually observed during the haul.
 - (o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - (p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.
 - (q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.
 - (r) Intended target species.
 - (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).

- (t) Estimate of the amount (weight or volume) of all marine resources discarded* and dropped off, split by species. * Including those retained for scientific samples.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - (a) Set start date (UTC).
 - (b) Set start time (UTC).
 - (c) Set end date (UTC).
 - (d) Set end time (UTC).
 - (e) Set start position (Lat/Lon, 1 minute resolution).
 - (f) Set end position (Lat/Lon, 1 minute resolution).
 - (g) Total length of longline set (m).
 - (h) Number of hooks or traps for the set.
 - (i) Bottom (seabed) depth at start of set.
 - (j) Bottom (seabed) depth at end of set.
 - (k) Number of hooks or traps actually observed during the haul.
 - (l) Intended target species.
 - (m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - (n) An estimation of the amount (numbers or weight) of marine resources discarded* or dropped-off, split by species, during the actual observation. * Including those retained for scientific samples.
 - (o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

E. Length-Frequency Data to Be Collected

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).

2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological sampling to be conducted (optional for gillnet and long line fisheries)

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - (a) Species
 - (b) Length (to the nearest mm), with record of the type of length measurement used.
 - (c) Length and depth in case of North Pacific armorhead.
 - (d) Sex (male, female, indeterminate, not examined)
 - (e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.
5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be collected on Incidental Captures of Protected Species

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
 - (a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - (b) Count of the number caught per tow or set.
 - (c) Life status (vigorous, alive, lethargic, dead) upon release.
 - (d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - (a) Species (identified as far as possible or accompanied by a photograph where identification is difficult).
 - (b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the fishing operation.
 - (c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the fishing operation.
 - (d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

I. Data to be collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - (a) Observer name.
 - (b) Vessel name.
 - (c) Vessel call sign.
 - (d) Vessel flag.
 - (e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
 - (f) Species from which tag recovered.
 - (g) Tag colour and type (spaghetti, archival).
 - (h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
 - (i) Date and time of capture (UTC).
 - (j) Location of capture (Lat/Lon, to the nearest 1 minute)
 - (k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
 - (l) Sex (F=female, M=male, I=indeterminate, D=not examined)
 - (m) Whether the tags were found during a period of fishing that was being observed (Y/N)

(n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

1. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
2. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - (a) Fishing Operation Information
 - All vessel and tow / set / effort information.
 - (b) Monitoring of Catches
 - Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
 - Record numbers or proportions of each species retained or discarded.
 - (c) Biological Sampling
 - Length-frequency data for target species.
 - Length-frequency data for main by-catch species.
 - Identification and counts of protected species.
 - Basic biological data (sex, maturity) for target species.
 - Check for presence of tags.
 - Otoliths (and stomach samples, if being collected) for target species.
 - Basic biological data for by-catch species.
 - Biological samples of by-catch species (if being collected)
 - Photos
3. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsino)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2

Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be used for Recording Observer Data

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
 - (a) Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
 - (b) Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - (c) Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
 - (a) Kilograms are to be used to describe catch weight.
 - (b) Metres are to be used to describe height, width, depth, beam or length.
 - (c) Cubic metres are to be used to describe volume.
 - (d) Kilowatts are to be used to describe engine power.

**Implementation of the Adaptive Management for North Pacific armorhead
(in 2021)**

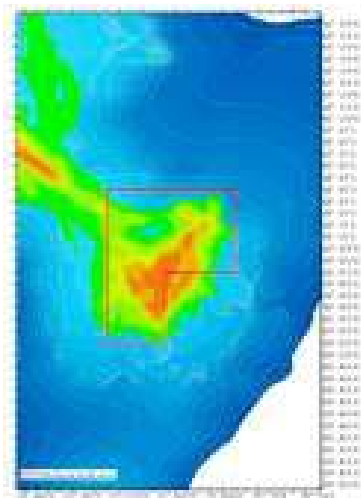
1. Monitoring survey for the detection of strong recruitment of North Pacific armorhead

(1) Location of monitoring surveys

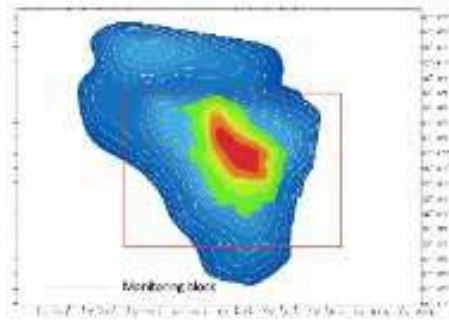
Monitoring surveys for the detection of strong recruitment of North Pacific armorhead will be conducted by trawl fishing vessels in the pre-determined four (24) monitoring blocks of Koko (South eastern), Yuryaku, Kammu (North western) and/or Colahan seamounts.

Monitoring blocks

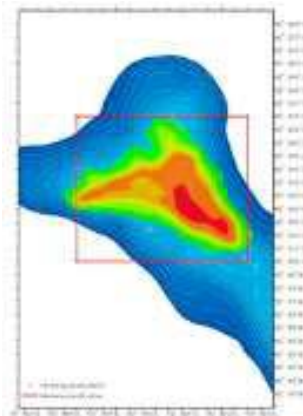
- (1) Koko seamount ($34^{\circ}51' - 35^{\circ}04'N$, $171^{\circ}49' - 172^{\circ}00' E$)



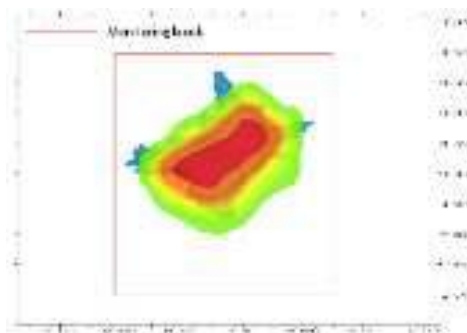
- (2) Yuryaku seamount ($32^{\circ}35' - 32^{\circ}45'N$, $172^{\circ}10' - 172^{\circ}24'E$)



(3) Kammu seamount (32°10'–32°21'N, 172°44'–172°57'E)



(4) Colahan seamount (30°57'–31°05'N, 175°50'–175°57'E)



(2) Schedule for monitoring surveys

Monitoring surveys will be conducted from March 1st to June 30th each year, with at least a one week interval between monitoring surveys. For each survey, a trawl fishing vessel will conduct a monitoring survey in one of the four monitoring blocks that is the nearest from the location of the trawl fishing vessel at the time of prior notification in (4) below. The base schedule for monitoring surveys will be notified to the Executive Secretary by the end of February of each year. The base schedule may be revised during the year subject to prior notification to the Executive Secretary.

(3) Data to be collected during monitoring surveys

For each monitoring survey, a trawl net will be towed for one hour. A scientific observer onboard the trawl fishing vessel will calculate nominal-CPUE (kg/hour) of North Pacific armorhead. The scientific observer will also calculate fat index* (FI) of randomly sampled 100 individuals of North Pacific armorhead by measuring fork length (FL) and body height (BH) of each individual.

(*fat index (FI) = body height (BH) / fork length (FL))

(4) Prior notifications and survey results

At least three (3) days before each survey, a prior notification with monitoring date/time, location and trawl fishing vessel name will be provided by the flag state of the trawl fishing vessel to the Executive Secretary.

No later than three (3) days after each survey, the survey result including date/time, location, catch, nominal-CPUE (kg/hour) and percentage of fish with fat index (FI)>0.3 will be provided by the flag state to the Executive Secretary.

The Executive Secretary will circulate these prior notifications and survey results to all Members of the Commission without delay.

1. Areas where bottom fishing with trawl gear is prohibited when high recruitment is detected

(1) Criteria for a high recruitment

It is considered that high recruitment has occurred if the following criteria are met in four (4) consecutive monitoring surveys.

- Nominal CPUE > 10t/h
- Individuals of fat index (FI)> 0.3 account for 80% or more

(2) Areas where bottom fishing with trawl gear is prohibited

Bottom fishing with trawl gear shall be prohibited in the following two (2) seamount areas (*) during the year when high recruitment is detected. In such a case, all monitoring surveys scheduled during the year will be cancelled.

- Northern part of Kammu seamount (north of 32°10.0' N)
- Yuryaku seamount

(*) The catch of North Pacific armorhead in the above two seamounts accounts for a half of the total catch in the entire Emperor Seamounts area based on the catch records in 2010 and 2012.

(3) Notification by the Secretariat

When the criteria for high recruitment are met as defined in 2(1) above, the Executive Secretary will notify all Members of the Commission of the fact with a defined date/time from which bottom fishing with trawl gear is prohibited in the areas as defined in 2(2) above until the end of the year.

Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean

CMM 2019-06

(Entered into force 29 November 2019)

**CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE
ECOSYSTEMS IN THE NORTHEASTERN PACIFIC OCEAN**

The North Pacific Fisheries Commission (NPFC):

Seeking to ensure the long term conservation and sustainable use of the fishery resources of the Northeastern Pacific Ocean and, in so doing, protect the vulnerable marine ecosystems that occur there, in accordance with the Sustainable Fisheries Resolutions adopted by the United Nations General Assembly (UNGA) including, in particular, paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, paragraphs 69 and 80 to 91 of UNGA61/105 in 2006, and paragraphs 113 to 124 of UNGA64/72 in 2009;

Recalling that paragraph 85 of UNGA 61/105 calls upon participants in negotiations to establish regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to adopt permanent measures in respect of the area of application of the instruments under negotiation;

Noting that North Pacific Fisheries Commission has previously adopted interim measures for the Northeastern Pacific Ocean;

Conscious of the need to adopt permanent measures for the Northeastern Pacific Ocean to ensure that this area is not left as the only major area of the Pacific Ocean where no such measures are in place;

Hereby adopt the following Conservation and Management Measure (CMM) for bottom fisheries of the Northeastern Pacific Ocean while working to develop and implement other permanent management arrangements to govern these and other fisheries in the North Pacific Ocean.

Scope

1. These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northeastern Pacific Ocean, defined, for the purposes of this document, as those

occurring in the Convention Area as set out in Article 4 of the Convention text to the east of the line of 175 degrees W longitude (here in after called “the eastern part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

For the purpose of these Measures, the term vulnerable marine ecosystems is to be interpreted and applied in a manner consistent with the International Guidelines on the Management of Deep Sea Fisheries on the High Seas adopted by the FAO on 29 August 2008 (see Annex 2 for further details).

2. The implementation of these Measures shall:
 - a. be based on the best scientific information available in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
 - b. establish appropriate and effective conservation and management measures,
 - c. be in accordance with the precautionary approach, and
 - d. incorporate an ecosystem approach to fisheries management.

3. Actions by Members of the Commission

Members of the Commission will take the following actions in respect of vessels operating under its Flag or authority in the area covered by these Measures:

 - a. Conduct the assessments called for in paragraph 83(a) of UNGA Resolution 61/105, in a manner consistent with the FAO Guidelines and the Standards and Criteria included in Annex 2;
 - b. Submit to the SC their assessments conducted pursuant to subparagraph (a) of this paragraph, including all relevant data and information in support of any such assessment, and receive advice and recommendations from the SC, in accordance with the procedures in Annex 3;
 - c. Taking into account all advice and recommendations received from the SC, determine whether the fishing activity or operations of the vessel in question are likely to have a significant adverse impact on any vulnerable marine ecosystem;
 - d. If it is determined that the fishing activity or operations of the vessel or vessels in question would have a significant adverse impact on vulnerable marine ecosystems, adopt conservation and management measures to prevent such impacts on the basis of advice and recommendations of the SC, which are subject to adoption by the Commission;
 - e. Ensure that if any vessels are already engaged in bottom fishing, that such assessments have

been carried out in accordance with paragraph 119(a)/UNGA RES 2009, the determination called for in subparagraph (c) of this paragraph has been rendered and, where appropriate, managements measures have been implemented in accordance with the advice and recommendations of the SC, which are subject to adoption by the Commission;

- f. Further ensure that they will only authorize fishing activities on the basis of such assessments and any comments and recommendations from the SC;
- g. Prohibit its vessels from engaging in directed fishing on the following orders: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia* as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the Commission;
- h. In respect of areas where vulnerable marine ecosystems are known to occur or are likely to occur, based on the best available scientific information, ensure that bottom fishing activities do not proceed unless conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems;
- i. Limit fishing effort in bottom fisheries on the Eastern part of the Convention Area to the level of a historical average (baseline to be determined through consensus in the SC based on information to be provided by Members) in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems dependent on new SC advice;
- j. Further, considering accumulated information regarding fishing activities in the Eastern part of the Convention Area, in areas where, in the course of fishing operations, cold water corals or other indicator species as identified by the SC that exceed 50Kg are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 2 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species ~~in question~~, shall be reported to the Secretariat, through the Member, within one business day, as soon as possible, The Executive Secretary ~~who~~ shall notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets, so that appropriate measures can be adopted in respect of the relevant site. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the cold water corals include: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the Commission.

j.k. Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.

4. All assessments and determinations by any Member as to whether fishing activity would have significant adverse impacts on vulnerable marine ecosystems, as well as measures adopted in order to prevent such impacts, will be made publicly available through agreed means.

Control of Bottom Fishing Vessels

5. Members will exercise full and effective control over each of their bottom fishing vessels operating in the high seas of the Northeastern Pacific Ocean, including by means of fishing licenses, authorizations or permits, and maintenance of a record of these vessels as outlined in the Convention and applicable CMM.
6. New and exploratory fishing will be subject to the exploratory fishery protocol included as Annex 1.

Scientific Committee (SC)

7. Scientific Committee will provide scientific support for the implementation of these CMMs.

Scientific Information

8. The Members shall provide all available information as required by the Commission for any current or historical fishing activity by their flag vessels, including the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, areas fished (names or coordinates of seamounts), and information from scientific observer programmes (see Annexes 4 and 5) to the NPFC Secretariat as soon as possible and no later than one month prior to SC meeting. The Secretariat will make such information available to SC.
9. Scientific research activities for stock assessment purposes are to be conducted in accordance with a research plan that has been provided to SC prior to the commencement of such activities.

EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.

2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:

- i. precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
- ii. precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
- iii. regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
- iv. measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
- v. comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.

3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:

(1) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.

(2) The assessment in (1) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.

(3) The SC is to review the information and the assessment submitted in (1) above in accordance with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”

(4) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the basis of comments and recommendations of SC. Any determinations, by any Member of the Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.

5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.

6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.

7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.

8. The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4(1)(a).

Appendix 1.1

Information to be provided before exploratory fisheries start

1. A harvesting plan

- Name of vessel
- Flag member of vessel
- Description of area to be fished (location and depth)
- Fishing dates
- Anticipated effort
- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

2. A mitigation plan

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

3. A catch monitoring plan

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

4. A data collection plan

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

Appendix 1.2

Information to be included in the report

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES

1. Introduction

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

2. Purpose

(1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities² on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the Commission.

(2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as

² “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.

follows:

- (a) The fisheries are conducted in the Convention Area;
- (b) The total catch (everything brought up by the fishing gear) includes species that can only sustain low exploitation rates; and
- (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations

3. Definition of VMEs

(1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.

(2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover, or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).

(3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.

- (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
 - (i) Habitats that contain endemic species;
 - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
 - (iii) Nurseries or discrete feeding, breeding, or spawning areas
- (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.

(c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities

(d) Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:

- (i) Slow growth rates
- (ii) Late age of maturity
- (iii) Low or unpredictable recruitment
- (iv) Long-lived

(e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

(4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. For example, whether the ecological unit is a group of seamounts, or an individual seamount in the Convention Area, is to be decided using the above criteria.

4. Identification of potential VMEs

(1) Fished seamounts

(a) Identification of fished seamounts

It is reported that two types of fishing gear are currently used by members of the Commission in the NE area, namely long-line hook and long-line trap. The footprint of the bottom fisheries (fished seamounts) is identified based on the available fishing record. The following seamounts have been identified as fished seamounts at some point in the past: Brown Bear, Cobb, Warwick, Eickelberg, Pathfinder, Miller, Murray, Cowie, Surveyor, Pratt, and Durgin. It is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may be physically unsuitable for certain fishing gears. Thus, it is important to know actual fished areas within the same seamount so as to know the gravity of the impact of fishing activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. [The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.](#)

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

5. Assessment of SAIs on VMEs or marine species

(1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.

(2) When determining the scale and significance of an impact, the following six factors are to be considered:

- (a) The intensity or severity of the impact at the specific site being affected;
- (b) The spatial extent of the impact relative to the availability of the habitat type affected;
- (c) The sensitivity/vulnerability of the ecosystem to the impact;
- (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;
- (e) The extent to which ecosystem functions may be altered by the impact; and
- (f) The timing and duration of the impact relative to the period in which a species needs the habitat during one or more life-history stages.

(3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

(4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.

(5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:

- (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
- (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
- (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment
- (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
- (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
- (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.

(6) Impact assessments are to consider, as appropriate, the information referred to in these

Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.

(7) Where an assessment concludes that the area does not contain VMEs or that significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

ANNEX 2.1

EXAMPLES OF POTENTIAL VULNERABLE SPECIES GROUPS, COMMUNITIES AND HABITATS AS WELL AS FEATURES THAT POTENTIALLY SUPPORT THEM

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself

is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which may contribute to forming VMEs:	
a.	certain coldwater corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), black corals (antipatharia), and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyphores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and
d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities, referred to above:	
a.	submerged edges and slopes (e.g., corals and sponges),
b.	summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges, xenophyphores),
c.	canyons and trenches (e.g., burrowed clay outcrops, corals),
d.	hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
e.	cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

ANNEX 2.2

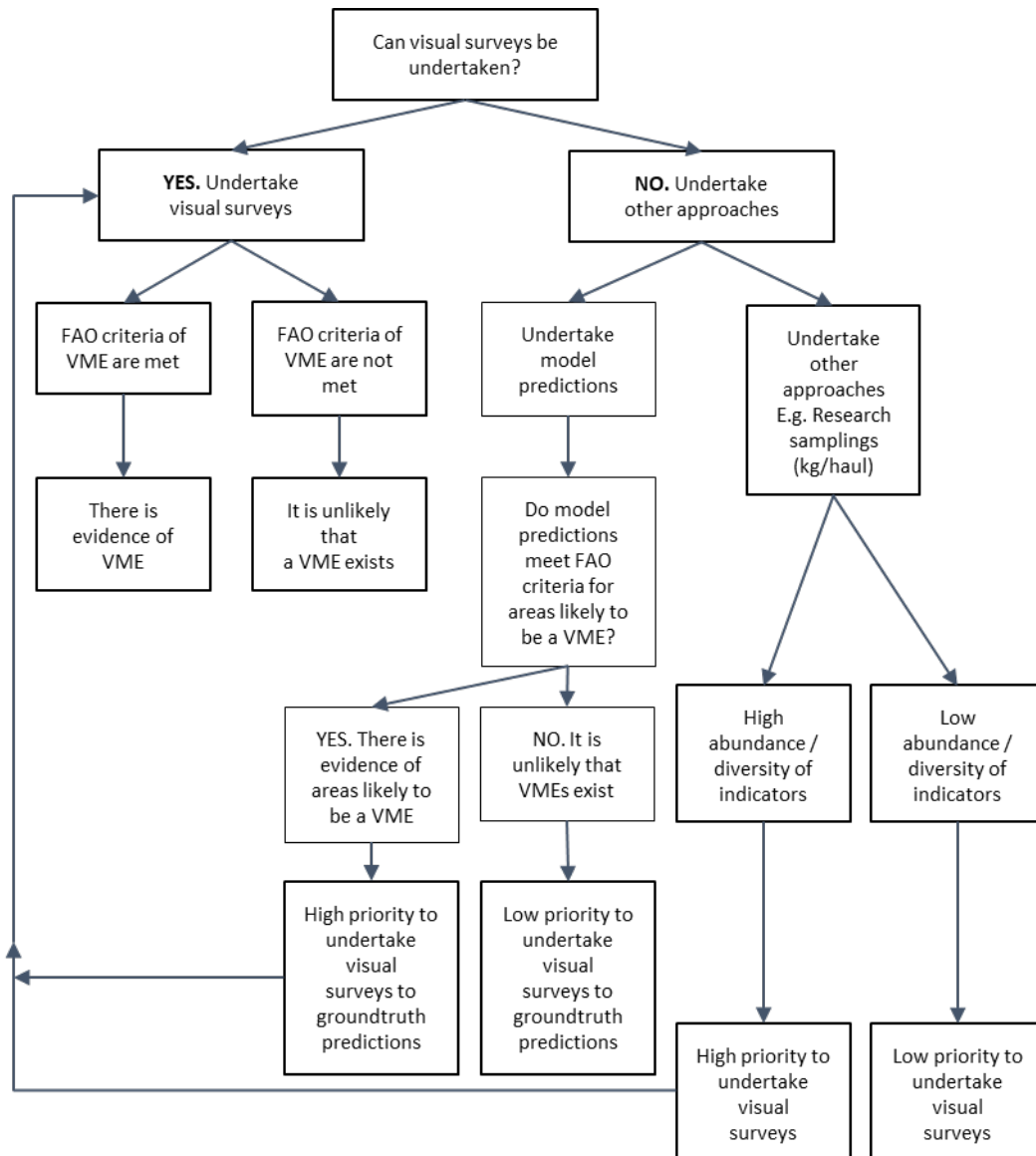
TEMPLATE FOR REPORTS ON IDENTIFICATION OF VMEs AND ASSESSMENT OF IMPACTS CAUSED BY INDIVIDUAL FISHING ACTIVITIES ON VMEs OR MARINE SPECIES

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)
3. Status of the fishery (existing fishery or exploratory fishery)

4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)
 - (1) Number of fishing vessels
 - (2) Tonnage of each fishing vessel
 - (3) Number of fishing days or days on the fishing ground
 - (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots per day for pot, total length of net per day for gillnet)
 - (5) Total catch by species
 - (6) Names of seamounts fished or to be fished
7. Fishing period
8. Analysis of status of fishery resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
9. Analysis of status of bycatch species resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
10. Analysis of existence of VMEs in the fishing ground
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species
12. Other points to be addressed
13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).

Annex 2.3

Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM FISHING ACTIVITIES

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons

- Catch Data: Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- Length Frequency Data: Number of fish measured per species, by area and season.
- Biological Data: Type and quantity of other biological data or samples (otoliths, sex, maturity, etc) collected per species.
- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Detection of Fishing in Association with Vulnerable Marine Ecosystems

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

E. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

F. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

**NPFC BOTTOM FISHERIES
OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT**

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
 - a) NPFC vessel ID
 - b) Observer's name.
 - c) Observer's organisation.
 - d) Date observer embarked (UTC date).
 - e) Port of embarkation.
 - f) Date observer disembarked (UTC date).
 - g) Port of disembarkation.

B. Catch & Effort Data to be collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - a) Tow start date (UTC).
 - b) Tow start time (UTC).
 - c) Tow end date (UTC).
 - d) Tow end time (UTC).
 - e) Tow start position (Lat/Lon, 1 minute resolution).
 - f) Tow end position (Lat/Lon, 1 minute resolution).
 - g) Type of trawl, bottom or mid-water.
 - h) Type of trawl, single, double or triple.
 - i) Height of net opening (m).
 - j) Width of net opening (m).
 - k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
 - l) Gear depth (of footrope) at start of fishing (m).

- m) Bottom (seabed) depth at start of fishing (m).
- n) Gear depth (of footrope) at end of fishing (m).
- o) Bottom (seabed) depth at end of fishing (m).
- p) Status of the trawl operation (no damage, lightly damaged*, heavily damaged*, other (specify)). *Degree may be evaluated by time for repairing (≤ 1 hr or > 1 hr)
- q) Duration of estimated period of seabed contact (minute)
- r) Intended target species.
- s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
 - a) Set start date (UTC).
 - b) Set start time (UTC).
 - c) Set end date (UTC).
 - d) Set end time (UTC).
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).
 - g) Net panel ("tan") length (m).
 - h) Net panel ("tan") height (m).
 - i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - j) Bottom depth at start of setting (m).
 - k) Bottom depth at end of setting (m).
 - l) Number of net panels for the set.
 - m) Number of net panels retrieved.
 - n) Number of net panels actually observed during the haul.
 - o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.

- q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.
- r) Intended target species.
- s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- t) Estimate of the amount (weight or volume) of all marine resources discarded* and dropped-off, split by species. * Including those retained for scientific samples.
- u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - a) Set start date (UTC).
 - b) Set start time (UTC).
 - c) Set end date (UTC).
 - d) Set end time (UTC).
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).
 - g) Total length of longline set (m).
 - h) Number of hooks or traps for the set.
 - i) Bottom (seabed) depth at start of set.
 - j) Bottom (seabed) depth at end of set.
 - k) Number of hooks or traps actually observed during the haul.
 - l) Intended target species.
 - m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - n) An estimation of the amount (numbers or weight) of marine resources discarded* or dropped-off, split by species, during the actual observation. * Including those retained for scientific samples.
 - o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

E. Length-Frequency Data to Be Collected

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).
2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological sampling to be conducted (optional for gillnet and long line fisheries)

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - a) Species
 - b) Length (to the nearest mm), with record of the type of length measurement used.
 - c) Length and depth in case of North Pacific armorhead.
 - d) Sex (male, female, indeterminate, not examined)
 - e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.

5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be collected on Incidental Captures of Protected Species

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
 - a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - b) Count of the number caught per tow or set.
 - c) Life status (vigorous, alive, lethargic, dead) upon release.
 - d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - a) Species (identified as far as possible, or accompanied by a photograph where identification is difficult).
 - b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the fishing operation.
 - c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the fishing operation.
 - d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

I. Data to be collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - a) Observer name.
 - b) Vessel name.
 - c) Vessel call sign.
 - d) Vessel flag.
 - e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
 - f) Species from which tag recovered.
 - g) Tag colour and type (spaghetti, archival).
 - h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
 - i) Date and time of capture (UTC).
 - j) Location of capture (Lat/Lon, to the nearest 1 minute)
 - k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
 - l) Sex (F=female, M=male, I=indeterminate, D=not examined)
 - m) Whether the tags were found during a period of fishing that was being observed (Y/N)
 - n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

2. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
3. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - a) Fishing Operation Information
 - All vessel and tow / set / effort information.

b) Monitoring of Catches

- Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
- Record numbers or proportions of each species retained or discarded.

c) Biological Sampling

- Length-frequency data for target species.
- Length-frequency data for main by-catch species.
- Identification and counts of protected species.
- Basic biological data (sex, maturity) for target species.
- Check for presence of tags.
- Otoliths (and stomach samples, if being collected) for target species.
- Basic biological data for by-catch species.
- Biological samples of by-catch species (if being collected)
- Photos

4. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsino)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be used for Recording Observer Data

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
 - a. Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
 - b. Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - c. Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
 - a. Kilograms are to be used to describe catch weight.
 - b. Metres are to be used to describe height, width, depth, beam or length.
 - c. Cubic metres are to be used to describe volume.
 - d. Kilowatts are to be used to describe engine power.

Stock Assessment Report for Pacific Saury

Abstract:

This report presents the results of stock assessment of Pacific saury updated at the 8th Small Scientific Committee on Pacific saury held virtually during December 10-14, 2021.

EXECUTIVE SUMMARY

Data

Pacific saury (*Cololabis saira*) is widely distributed from the subarctic to the subtropical regions of the North Pacific Ocean. The fishing grounds are west of 180° E but differ among Members (China, Japan, Korea, Russia, Chinese Taipei, and Vanuatu). Figure 1 shows the historical catches of Pacific saury by Member. Figure 2 shows CPUE and Japanese survey biomass indices used in the stock assessment. Appendix 1 shows data used for the updated stock assessment.

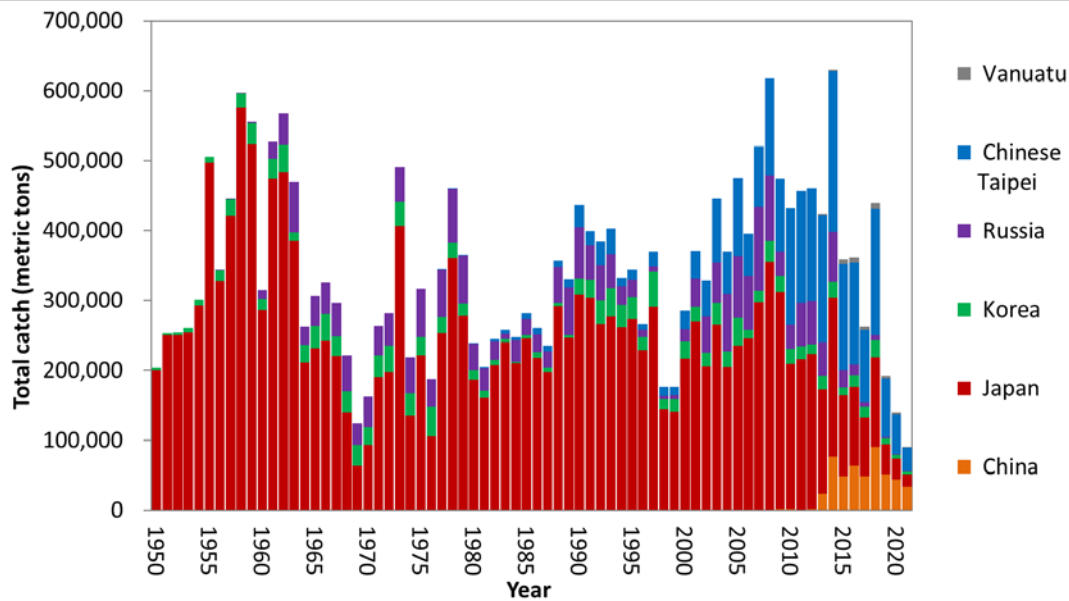


Figure 1. Time series of catch by Member during 1950-2021. The catch data for 1950-1979 are shown but not used in stock assessment modeling. 2021 catch data are preliminary (as of 27 November 2021).

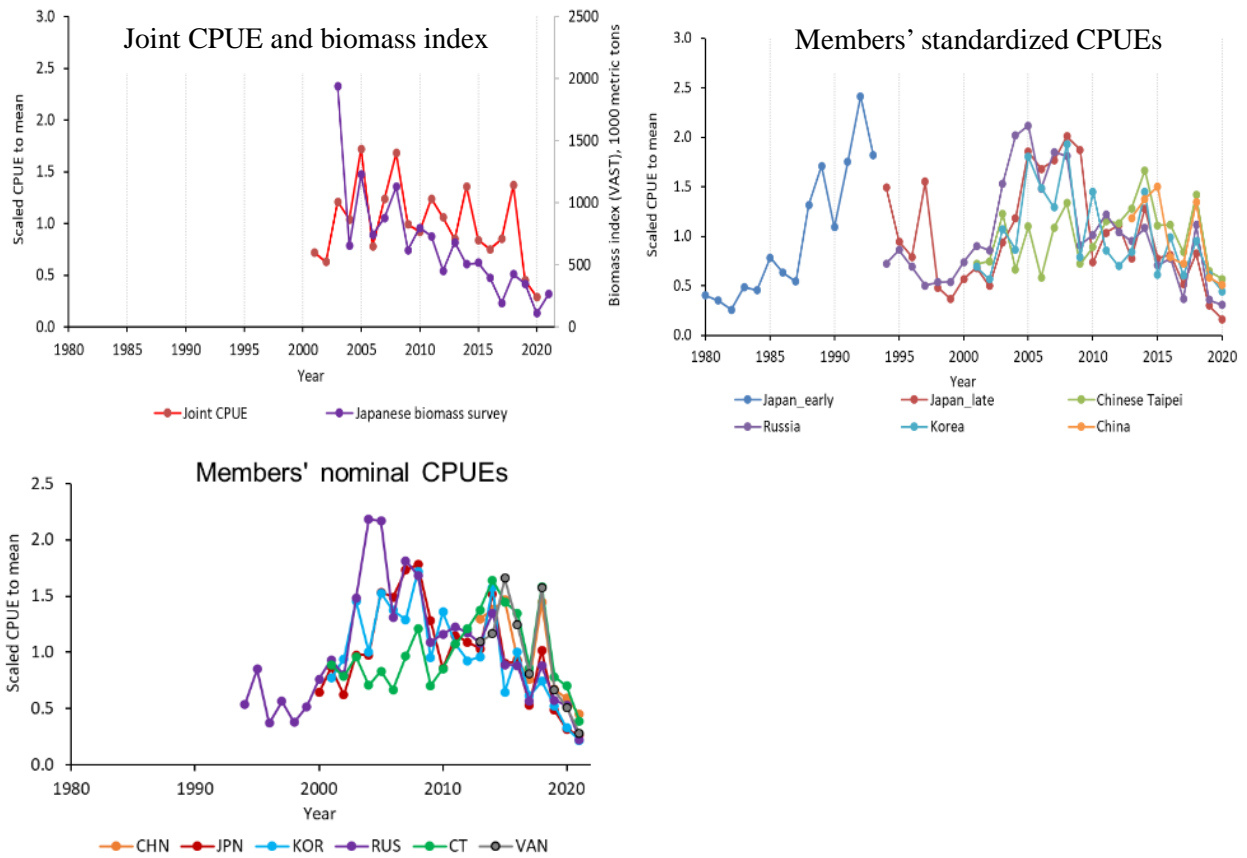


Figure 2. Time series of Japanese survey biomass index and joint, standardized and nominal CPUE indices. The nominal CPUE data are shown but not used in stock assessment modeling. 2021 nominal CPUEs are preliminary (as of November 2021).

Brief description of specification of analysis and models

A Bayesian state-space production model (BSSPM) used in previous stock assessments was employed as an agreed provisional stock assessment model for Pacific saury during 1980-2021. Scientists from three Members (China, Japan and Chinese Taipei) each conducted analyses following the agreed specification which called for two base case scenarios and two sensitivity scenarios (see Annex G, SSC PS07 report for more details). The two base case scenarios differ in using Japanese early CPUE (base case B1) or not (base case B2). Time-varying catchability for Japanese CPUE was assumed in B1 to account for potential increases in catchability between 1980 and 1994. A higher weight was given to the Japanese biomass survey estimates than to Members' CPUEs. The CPUE data were modeled as nonlinear indices of biomass. Members used similar approaches with some differences in the assumption of the time-varying catchability and prior distributions for the free parameters in the model.

Summary of stock assessment results

The SSC PS considered the BSSPM results and noted similarity among Members' results. Therefore, outcomes of MCMC runs were aggregated over the 6 models (2 base case models x 3 Members). The aggregated results for assessing the overall median values and their associated 80% credible intervals are shown in Table 1. The graphical presentations for times series of a) biomass (B), b) B-ratio ($=B/B_{MSY}$), c) exploitation rate (F), d) F-ratio (F/F_{MSY}) and e) B/K are shown in Figure 3. The Kobe plot with time trajectory using aggregated model outcomes is shown in Figure 4. Time series of median estimated values for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K are shown in Table 2.

Table 1. Summary of estimates of reference quantities. Median values are presented.

	Median	Lower10%	Upper10%	Median_CHN	Median_JPN	Median_CT
C_2020 (10000 t)	13.968	13.968	13.968	13.968	13.968	13.968
AveC_2018_2020 (10000 t)	25.704	25.704	25.704	25.704	25.704	25.704
AveF_2018_2020	0.435	0.180	0.743	0.482	0.515	0.298
F_2020	0.322	0.144	0.590	0.353	0.355	0.253
FMSY	0.352	0.185	0.559	0.370	0.357	0.334
MSY	41.901	33.956	56.291	43.358	40.529	42.145
F_2020/FMSY	0.938	0.523	1.529	0.986	1.033	0.794
AveF_2018_2020/FMSY	1.247	0.647	1.967	1.334	1.480	0.936
K (10000 t)	255.121	157.185	517.839	253.100	242.055	268.400
B_2020 (10000 t)	43.415	23.680	96.706	39.625	39.345	55.200
B_2021 (10000 t)	54.774	30.260	122.400	51.790	47.993	70.355
AveB_2019_2021 (10000 t)	50.173	28.629	115.984	46.317	43.323	67.935
BMSY (10000 t)	120.784	76.740	236.751	119.600	114.410	127.700
BMSY/K	0.465	0.389	0.577	0.461	0.463	0.471
B_2020/K	0.175	0.099	0.275	0.159	0.161	0.208
B_2021/K	0.223	0.123	0.353	0.209	0.195	0.265
AveB_2019_2021/K	0.207	0.120	0.319	0.191	0.179	0.255
B_2020/BMSY	0.361	0.218	0.587	0.327	0.339	0.428
B_2021/BMSY	0.463	0.264	0.765	0.432	0.412	0.550
AveB_2019_2021/BMSY	0.427	0.260	0.693	0.390	0.378	0.528

Table 2. Time series of median estimated values for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K. The unit of biomass is 10,000 tons.

Year	Biomass	HarvestRate	Bratio	Fratio	Depletion
1980	92.275	0.258	0.738	0.777	0.353
1981	98.031	0.208	0.803	0.617	0.384
1982	108.000	0.227	0.899	0.663	0.431
1983	116.000	0.222	0.982	0.640	0.468
1984	121.499	0.203	1.036	0.580	0.494
1985	130.400	0.216	1.113	0.616	0.530
1986	131.400	0.198	1.122	0.565	0.537
1987	135.851	0.173	1.160	0.492	0.555
1988	151.300	0.236	1.285	0.672	0.616
1989	150.201	0.220	1.266	0.632	0.610
1990	148.400	0.294	1.242	0.847	0.597
1991	141.800	0.281	1.186	0.817	0.570
1992	139.400	0.275	1.157	0.809	0.555
1993	131.900	0.305	1.093	0.899	0.525
1994	122.000	0.273	1.020	0.803	0.490
1995	113.191	0.304	0.934	0.906	0.448
1996	100.900	0.264	0.823	0.797	0.395
1997	98.680	0.375	0.794	1.146	0.381
1998	78.871	0.224	0.631	0.681	0.302
1999	83.925	0.210	0.669	0.638	0.319
2000	103.363	0.277	0.830	0.835	0.395
2001	116.200	0.319	0.949	0.945	0.454
2002	129.649	0.253	1.078	0.740	0.517
2003	209.600	0.212	1.820	0.596	0.889
2004	150.700	0.245	1.265	0.713	0.618
2005	197.277	0.240	1.690	0.686	0.822
2006	162.100	0.243	1.356	0.709	0.666
2007	178.800	0.291	1.519	0.835	0.743
2008	190.100	0.325	1.641	0.918	0.797
2009	133.642	0.353	1.116	1.035	0.547
2010	137.200	0.313	1.157	0.909	0.565
2011	130.517	0.350	1.102	1.013	0.538
2012	108.700	0.424	0.915	1.229	0.448
2013	116.996	0.362	0.993	1.043	0.487
2014	112.233	0.561	0.964	1.589	0.473
2015	89.430	0.401	0.760	1.153	0.372
2016	76.115	0.475	0.641	1.378	0.314
2017	56.540	0.464	0.473	1.352	0.231
2018	73.870	0.594	0.631	1.690	0.308
2019	52.106	0.369	0.438	1.072	0.213
2020	43.415	0.322	0.361	0.938	0.175
2021	54.774		0.463		0.223

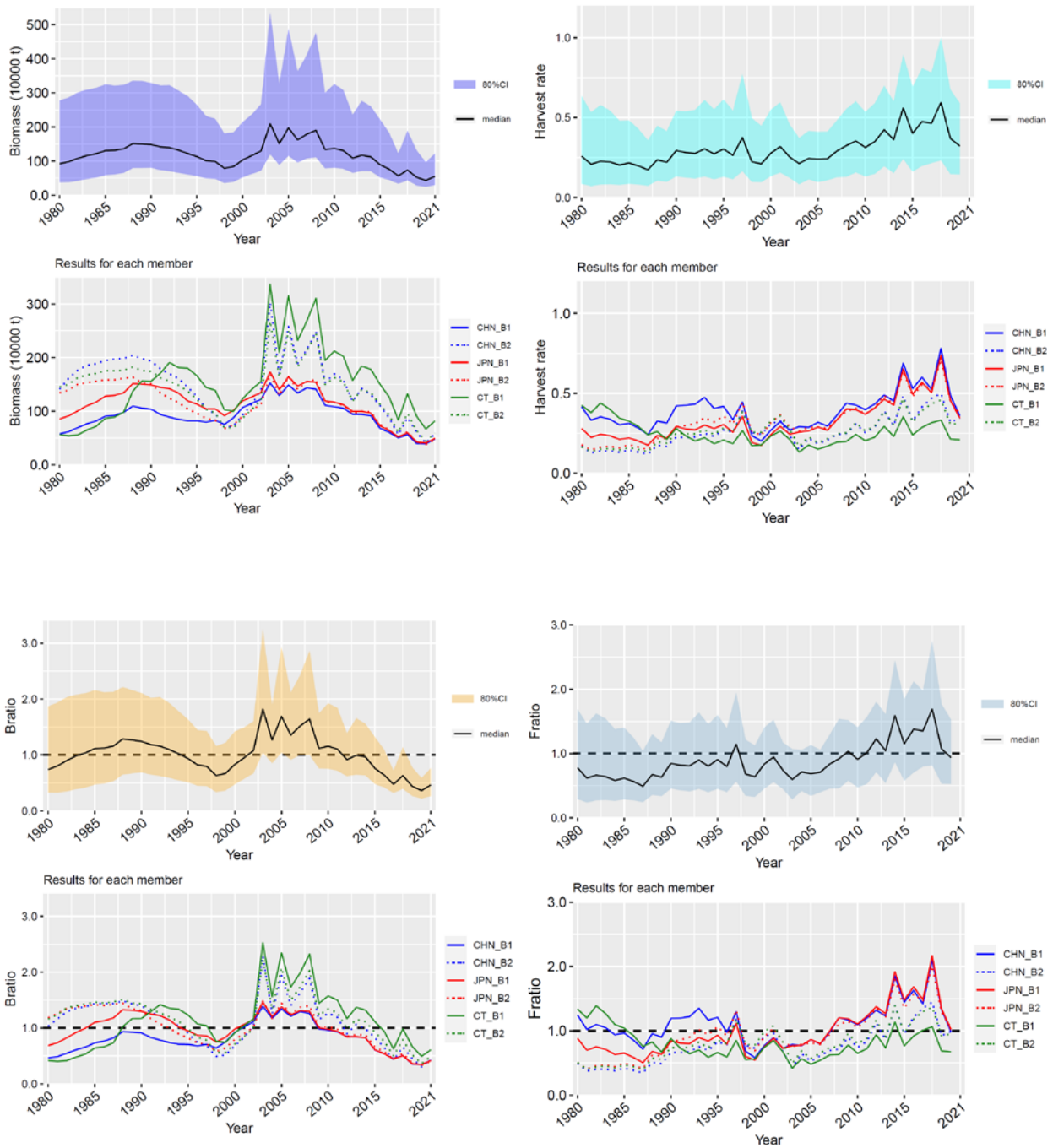


Figure 3. Time series of median estimated values of six runs for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K. The solid and shaded lines correspond to B1 and B2, respectively.

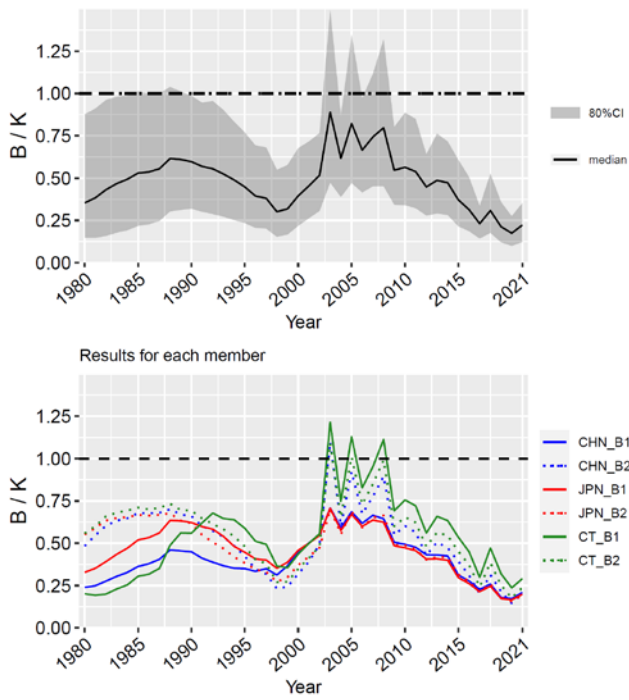


Figure 3 (Continued).

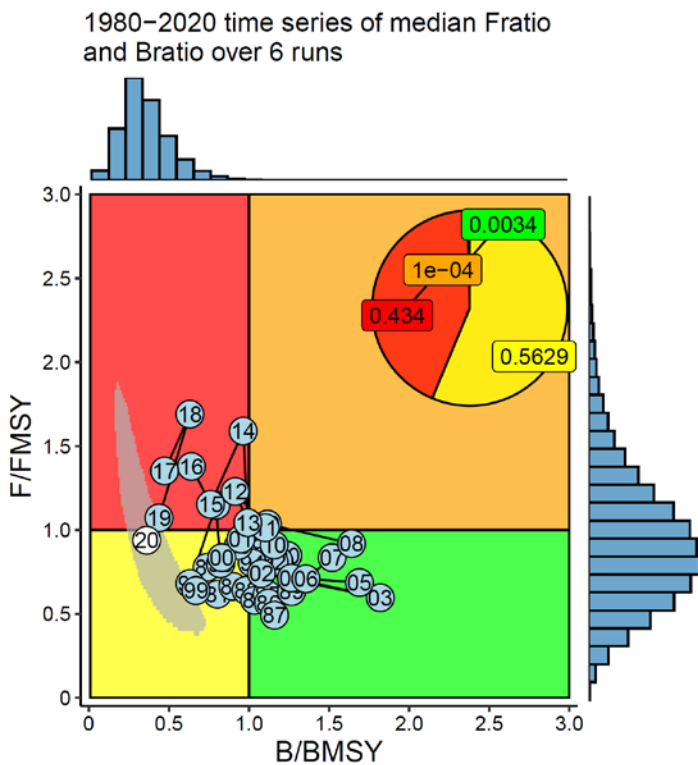


Figure 4. Kobe plot with time trajectory. The data are aggregated across 6 model results (2 base-case models by 3 Members).

Nominal CPUE trends and standardized CPUEs used in assessment modeling were similar (Figure 2). Preliminary catch (around 90,000 mt as of 27 November) and preliminary nominal CPUE in 2021 for each Member were at the lowest levels historically. CPUE declines more slowly than stock biomass as demonstrated in all BSSPM results for Pacific saury. Thus, the decline in stock biomass was probably greater than the decline in CPUE.

The Japanese fishery-independent survey is important in Pacific saury stock assessments. However, sampling did not cover the traditional survey area outside the 13°C isotherm and east of 170° W in 2020, and the area in the easternmost and a part of the second easternmost lines in 2021. The SSC PS07 reviewed the result from VAST model to extrapolate over the unsampled area. VAST model estimates were similar to survey swept-area-biomass in recent years but appeared less accurate for early years when stock biomass was highest. The VAST model estimate for Pacific saury biomass index was 110 thousand mt (CV 158%, 95% CI 20-942 thousand mt) in 2020 and 266 thousand mt (CV 33%, 95% CI 151-518 thousand mt) in 2021. The SSC PS07 endorsed the use of the VAST point estimates with their uncertainty in the BSSPM stock assessment instead of the original swept-area biomass index.

Potential Covid-19 effects on CPUE and catches were not considered in this assessment but may be important. Members should consult fishermen regarding possible impacts of COVID-19 on the fishery.

Current stock condition

Results of combined model estimates indicate that the stock declined with an interannual variability from near carrying capacity in the mid-2000's after a period of high productivity to current low levels. Exploitation rates were increasing slowly since 2005 except for 2019. The results also indicated that B was below B_{MSY} (median average B/B_{MSY} during 2019-2021 = 0.427, 80% CI=0.260-0.693) and F was above F_{MSY} (average F/F_{MSY} during 2018-2020 = 1.247, 80% CI= 0.647-1.967). The results further indicated that stock biomass fell to the lowest value since 1980 in 2020 (median B/B_{MSY} = 0.361, 80% CI=0.218-0.587) and has been still at a historically low level in recent years (2019-2021). Information of the nominal CPUE series further indicated that Pacific saury stock biomass has likely been near a record low level in 2021.

HCR and reference points have not yet been established for Pacific saury although an HCR is needed and research is expected to begin this year. The Commission used F_{MSY} catch in place of an HCR to set the TAC for 2020 ($TAC = F_{MSY} \times Biomass$). According to special comment #4 in the 2020 stock assessment “the F_{MSY} catch approach resulted in a TAC for 2020 that was substantially larger than the actual catch” and “TAC values could be calculated using the F_{MSY} estimate and historical biomass estimates from the BSSPM for comparison to actual catches”.

Results from the suggested calculations for 2020 based on updated estimates differ because the 2020 F_{MSY} catch is only slightly larger than the observed catch (Figure 5). The difference is probably due to uncertainty in the scale of estimated biomass and trend for terminal years.

Based on the updated figures, F_{MSY} catch levels were higher than actual catch during 1980-2010, lower during 2011-2017 and 2021 and nearly the same during 2018-2019. In 2014 and 2018 catch was substantially higher than the F_{MSY} catch level. Thus, biomass was relatively high prior to 2011 while catches were less than F_{MSY} catch and biomass declined to a historical low during 2011-2021 while catches were usually greater than or equal to F_{MSY} catch. Based on these results, catches generally exceeded the F_{MSY} catch level and contributed to the recent decline in biomass.

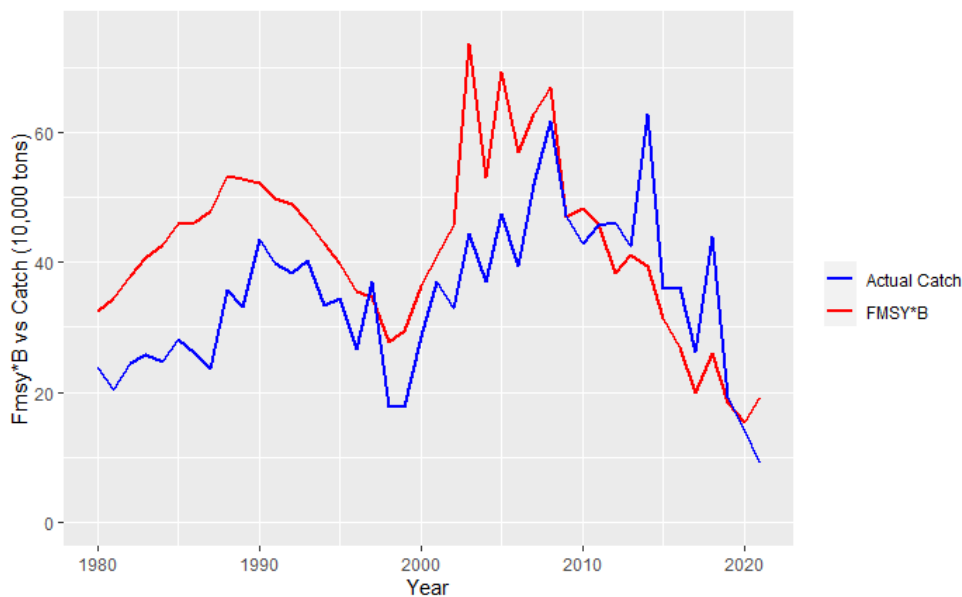


Figure 5. Median time series of $F_{MSY} \cdot B$ and the actual catch. Note that the catch in 2021 is a preliminary number as of Nov 27, 2021.

Special comments regarding the procedures and stock assessment results

The SSC PS worked collaboratively to produce this consensus stock assessment, which includes significant technical improvements.

- 1) Standardized CPUE data were assumed to change more slowly than biomass and were down-weighted relative to the Japanese survey. The estimates of a nonlinear parameter in the assessment model support this modeling decision.
- 2) Retrospective analyses have shown that BSSPM model projections are not suitable for use by managers and they have therefore been omitted (See discussion in the 2019 assessment (NPFC-2019-SSC PS04-Final Report)). Projections are problematic because recruits and older Pacific saury are not distinguished in the model, environmental effects are important but not predictable and because the species is short-lived. However, the Japanese assessment used projections to illustrate the response of a hypothetical stock to various levels of harvest during 2022-2026. The results indicate that substantial changes in stock size may occur over five years if harvest levels are held steady at levels higher or lower than recent levels but should be interpreted carefully. They illustrate potential effects of various harvest levels for a hypothetical stock similar to Pacific saury under idealized and constant conditions but little or no information about actual stock conditions that may develop in coming years. Importantly, they ignore unfavorable recent environmental conditions and random variation in surplus production that is common in the actual stock.
- 3) The 2020 biomass index from the Japanese survey has large uncertainties due to incomplete survey coverage.
- 4) The relative importance of fishing and environmental factors on the population dynamics of Pacific saury is unknown and an important area for research. However, changing environmental conditions may have contributed to the decline and current low stock size of Pacific saury. However oceanographic or biological factors responsible for changes in productivity have not yet been determined. Development of modeling procedures to incorporate environmental change is an important area for future research. The work should include refinements to stock assessment models to better reflect and estimate environmental effects on recruitment and biology. This work should be coordinated among Members and folded into the development of age-structured and improved BSSPM models.
- 5) Any new HCR for Pacific saury should include concrete definitions of overfishing (F too high) and overfished stock status (biomass too low) based on clearly defined reference points (targets and limits). The

Commission may consider what actions it will take if overfishing or overfished stock status occur.

- 6) New HCRs should be evaluated in future work. For example, TAC calculations such as F_{MSY} catch ($C = F_{MSY} \times B$) may be sensitive to uncertainty in the scale of the biomass estimates from models with process errors, prior assumptions and other features such as those in the BSSPM. They are sensitive to uncertainty in trend during the terminal years. It will be useful to consider index based HCR approaches for Pacific saury such as those that use biomass trend information from a survey or model and catch data (e.g. the AIM index method, see <https://nmfs-fish-tools.github.io/AIM/>).
- 7) In the next assessment, the geographic area to which data and assessment estimates apply (Convention Area, Members' EEZ or both) should be described.

1. INTRODUCTION

1.1 Distribution

Pacific saury (*Cololabis saira* Brevoort, 1856) has a wide distribution extending in the subarctic and subtropical North Pacific Ocean from inshore waters of Japan and the Kuril Islands to eastward to the Gulf of Alaska and southward to Mexico. Pacific saury is a commercially important fish in the western North Pacific Ocean (Parin 1968; Hubbs and Wisner 1980).

1.2 Migration

Pacific saury migrates extensively between the northern feeding grounds in the Oyashio waters around Hokkaido and the Kuril Islands in summer and the spawning areas in the Kuroshio waters off southern Japan in winter (Fukushima 1979; Kosaka 2000). Pacific saury in offshore regions (east of 160°E) also migrate westward toward the coast of Japan after October every year (Suyama et al. 2012).

1.3 Population structure

Genetic evidence suggests there are no distinct stocks in the Pacific saury population based on 141 individuals collected from five distant locales (East China Sea, Sea of Okhotsk, northwest Pacific, central North Pacific, and northeast Pacific) (Chow et al. 2009).

1.4 Spawning season and grounds

The spawning season of Pacific saury is relatively long, beginning in September and ending in June of the following year (Watanabe and Lo 1989). Pacific saury spawns over a vast area from the Japanese coastal waters to eastern offshore waters (Baitaliuk et al. 2013). The main spawning grounds are considered to be located in the Kuroshio-Oyashio transition region in fall and spring and in the Kuroshio waters and the Kuroshio Extension waters in winter (Watanabe and Lo 1989).

1.5 Food and feeding

The Pacific saury larvae prey on the nauplii of copepods and other small-sized zooplankton. As they grow, they begin to prey on larger zooplankton such as krill (Odate 1977). The Pacific saury is preyed on by large fish ranked higher in the food chain, such as *Thunnus alalunga* (Nihira 1988) and coho salmon, *Oncorhynchus kisutch* (Sato and Hirakawa 1976) as well as by animals such as minke whales *Balaenoptera acutorostrata* (Konishi et al. 2009) and sea birds (Ogi 1984).

1.6 Age and growth

Based on analysis of daily otolith increments, Pacific saury reaches approximately 20 cm in knob length (distance from the tip of lower jaw to the posterior end of the muscular knob at the base of a caudal peduncle; hereafter as body length) in 6 or 7 months after hatching (Watanabe et al. 1988; Suyama et al. 1992). There is some variation in growth rate depending on the hatching month during this long spawning season (Kurita et al. 2004) and geographical differences (Suyama et al. 2012b). The maximum lifespan is 2 years (Suyama et al. 2006). The age 1 fish grow to over 27 cm in body length in June and July when Japanese research surveys are conducted and reach over 29 cm in the fishing season between August and December (Suyama et al. 2006).

1.7 Reproduction

The minimum size of maturity of Pacific saury has been estimated at about 25 cm in the field (Hatanaka 1956) or rearing experiments (Nakaya et al. 2010). In rare cases, saury have been found to mature at 22 cm (Sugama 1957; Hotta 1960). Under rearing experiments, Pacific saury begins spawning 8 months after hatching, and spawning activity continues for about 3 months (Suyama et al. 2016). Batch fecundity is about 1,000 to 3,000 eggs per saury (Kosaka 2000).

2. FISHERY

2.1 Overview of fisheries

Western North Pacific

In Japan, the stick-held dip net fishery for Pacific saury was developed in the 1940s. Since then, the stick-held dip net gears have become the dominant fishing technique to catch Pacific saury in the northwest Pacific Ocean. Since 1995, more than 97% of Japan's total catch is caught by the stick-held dip net. The annual catch of Pacific saury for stick-held dip net fishery has fluctuated. Maximum and minimum catches of 355 thousand tons and 30 thousand tons were recorded in 2008 and 2020, respectively.

Pacific saury fisheries in Korea have been operated with gillnet since the late 1950s in Tsushima Warm Current region. Korean stick-held dip net fishery started from 1985 in the Northwest Pacific Ocean. The largest catch of 50 thousand tons was recorded in 1997 (Gong and Suh 2013).

Russian fishery for Pacific saury has been conducted using stick-held dip nets in the northwest Pacific Ocean in the area that includes national waters (mainly within the Russian EEZ) and adjacent NPFC Convention Areas. Russian catch statistics for saury fishery exists, beginning from 1956, and standardized CPUE indices from that fishery were calculated since 1994. Saury fishery traditionally occurred from August to November; however, in recent years, the onset of fishing for saury shifted to the early summer period. Peak catch of saury of over 100 thousand tons was in 2007. Since then, the annual catch has been decreasing, and was about 2.4 thousand tons in 2019 and about 750 tons in 2020.

China commenced its exploratory saury fishing using stick-held dip nets in the high seas in 2003, but only started to develop this fishery in 2012. The fishing seasons mainly cover the period from June-November.

Chinese Taipei's Pacific saury fishery can date back to 1975 and had its first commercial catch in 1977. Over the past decade, the number of active Pacific saury fishing vessels has been increasing from 68 to 91 and the catch has fluctuated between 39,750 tons and 229,937 tons since 2001. Aside from Pacific saury fishery, most of the Pacific saury fishing vessels also conduct flying squid jigging operations in the Northwest Pacific Ocean.

Vanuatu commenced its development of Pacific saury fishery by using stick-held dip net in the high seas in 2004. Currently there are four vessels operating in the Northwest Pacific targeting saury, but the total accumulative number of its authorized Pacific saury fishing vessels from 2004 to 2020 is 16. The fishing season mainly covers the period from July to November each year.

Eastern North Pacific

Although Pacific saury occur in the Canada EEZ, there is no targeted fishery for the species. There is no historical record of Canadian participation in international fisheries for saury. Domestic fisheries sometimes capture saury as bycatch in pelagic and bottom trawls and there are a handful of records from other gear types including commercial longlines. The most recently compiled estimates indicate only 224 kg of saury were captured by Canadian commercial fisheries over 17 years from 1997-2013 (Wade and Curtis 2015). There are also records of saury catches from research trawls (surface, pelagic and bottom trawls) in Canadian waters, but the catches have been minimal.

Management plans developed by the United States' National Marine Fisheries Service currently prohibit targeted fishing on marine forage species including the Pacific saury. In the 1950's to mid-1970's there were sporadic attempts to commercially fish for Pacific saury off of California with limited success using purse seines and light attraction (Kato 1992). Catches from 1969-1972 averaged 450 tons. Currently landings are only "occasionally" reported as bycatch in fisheries on the US west coast. Landings of Pacific saury as bycatch on the US west coast averaged 5.5 kg per year from 2011-2015 (NOAA Fisheries National Bycatch Report Database System, <https://www.st.nmfs.noaa.gov/>, accessed March 8, 2019)

Historically, Japanese and Russian vessels operated mainly within their own EEZs, but they have shifted into the Convention Area in recent years. Chinese, Korean and Chinese Taipei vessels operate mainly in the high seas of the North Pacific (Figure 1).

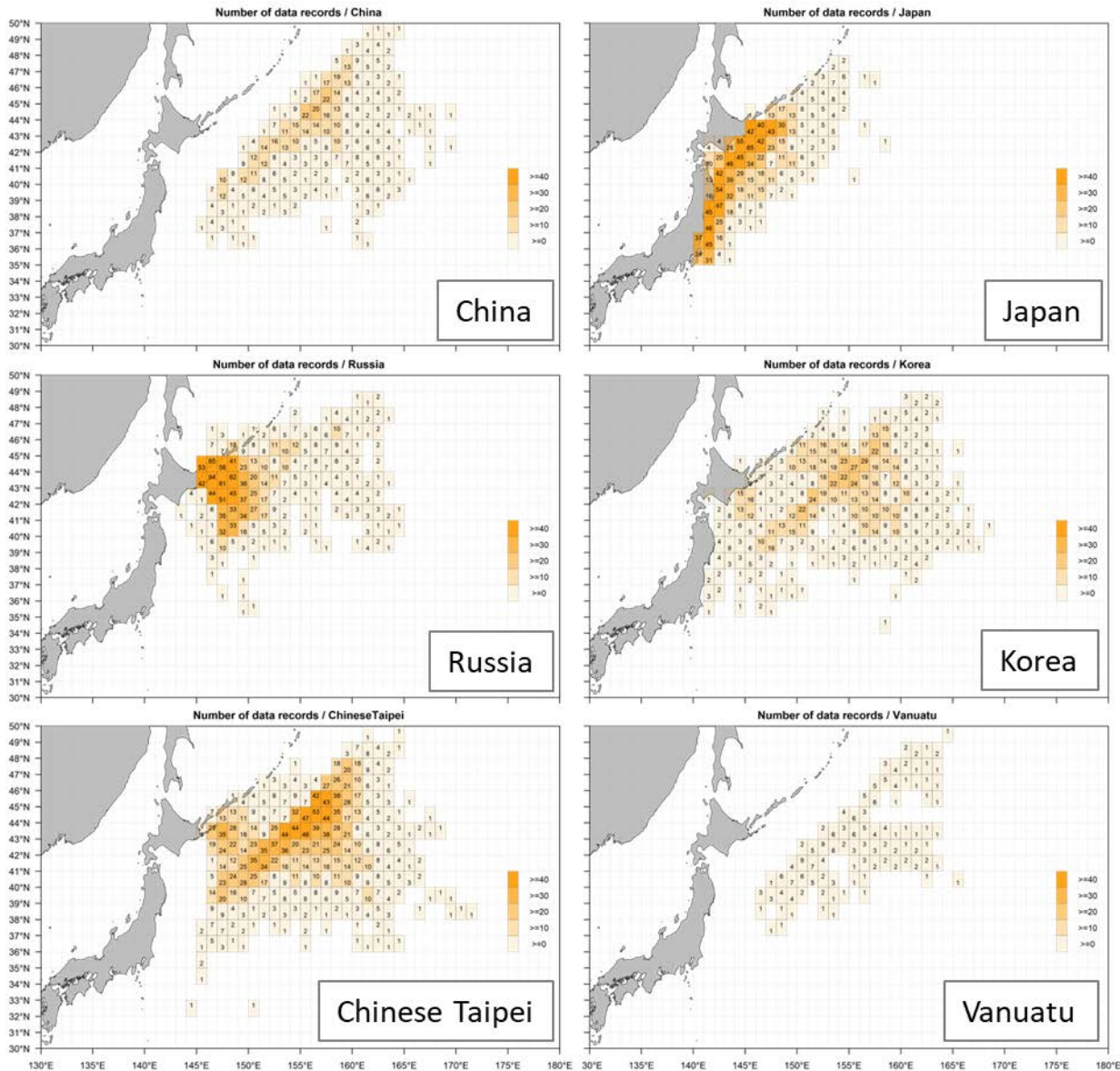


Figure 1. Main fishing grounds for Pacific saury by fishing members in the western North Pacific Ocean during 1994-2017. The legend shows the number of data records. This figure is based on the data shared by the Members for the development of a joint CPUE index (NPFC-2018-TWG PSSA03-WP02, NPFC-2018-TWG PSSA03-WP03, NPFC-2018-TWG PSSA03-WP04, NPFC-2018-TWG PSSA03-WP06b, NPFC-2018-TWG PSSA03-WP08, and NPFC-2018-TWG PSSA03-WP12; available at www.npfc.int).

2.2 Catch records

Figure 2 shows the historical catches of Pacific saury in the northwest Pacific Ocean by Member.

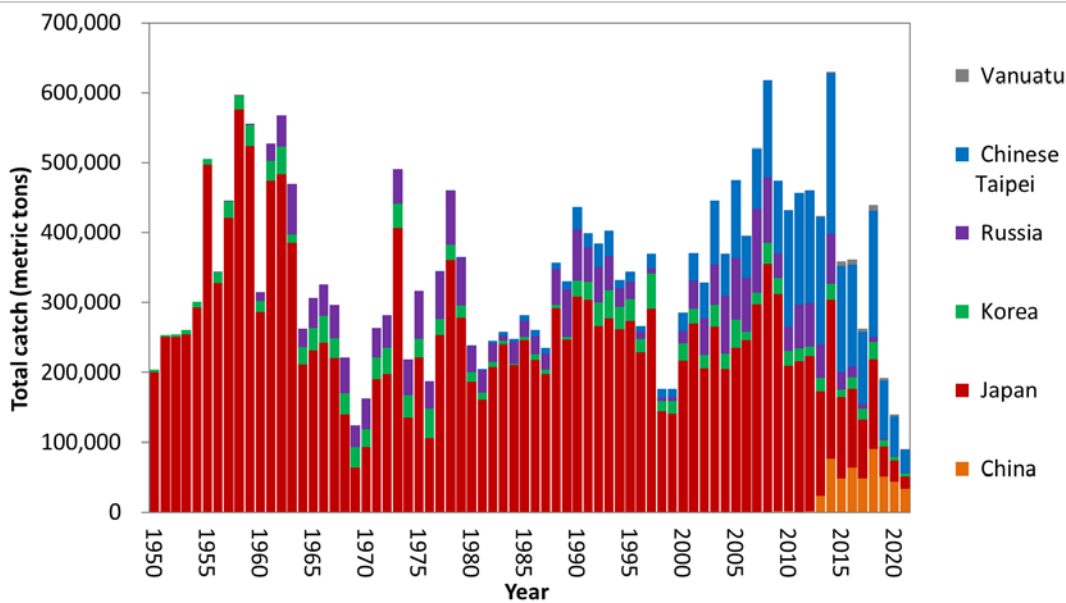


Figure 2. Time series of catch by Member during 1950-2021. The catch data for 1950-1979 are shown but not used in stock assessment modeling. 2021 catch data are preliminary (as of 27 November 2021).

3. SPECIFICATION OF STOCK ASSESSMENT

A Bayesian state-space production model (BSSPM) used in previous stock assessments was employed as an agreed provisional stock assessment model for Pacific saury during 1980-2021. Scientists from three Members (China, Japan and Chinese Taipei) each conducted analyses following the agreed specification which called for two base case scenarios and two sensitivity scenarios (see Annex G, SSC PS07 report for more details). The two base case scenarios differ in using Japanese early CPUE (base case B1) or not (base case B2). Time-varying catchability for Japanese CPUE was assumed in B1 to account for potential increases in catchability between 1980 and 1994. A higher weight was given to the Japanese biomass survey estimates than to Members' CPUEs. The CPUE data were modeled as nonlinear indices of biomass. Members used similar approaches with some differences in the assumption of the time-varying catchability and prior distributions for the free parameters in the model.

3.1 Bayesian state-space production model

The population dynamics is modelled by the following equations:

$$B_t = \{B_{t-1} + B_{t-1}f(B_{t-1}) - C_{t-1}\} e^{u_t}, \quad u_t \sim N(0, \tau^2)$$

$$f(B_t) = r \left[1 - \left(\frac{B_t}{K} \right)^z \right]$$

where

B_t : the biomass at the beginning of year t

C_t : the total catch of year t

u_t : the process error in year t

$f(B)$: the production function (Pella-Tomlinson)

r : the intrinsic rate of natural increase

K : the carrying capacity

z: the degree of compensation (shape parameter; different symbols were used by the 3 members)

The multiple biomass indices are modelled as follows:

Survey biomass estimate

$$I_{t,biomass} = q_{biomass} B_t \exp(v_{t,biomass}), \quad \text{where } v_{t,biomass} \sim N(0, \sigma_{biomass}^2)$$

where

$q_{biomass}$: the relative bias in biomass estimate

$v_{t,biomass}$: the observation error term in year t for survey biomass estimate

$\sigma_{biomass}^2$: the observation error variance for survey biomass estimate

CPUE series

$$I_{t,f} = q_f B_t^b \exp(v_{t,f}), \quad \text{where } v_{t,f} \sim N(0, \sigma_f^2)$$

where

$I_{t,f}$: the biomass index in year t for biomass index f

q_f : the catchability coefficient for biomass index f

b : the hyper-stability/depletion parameter

$v_{t,f}$: the observation error term in year t for biomass index f

σ_f^2 : the observation error in year t for biomass index f

For the estimation of parameters, Bayesian methods were used with different own preferred assumption for the prior distributions for the free parameters. MCMC methods were employed for simulating the posterior distributions. For the assumptions of uniform priors used in China and Japan, see documents NPFC-2020-SSC PS06-WP08 and NPFC-2020-SSC PS06-WP10; for the non-uniform priors used in Chinese Taipei, see document NPFC-2020-SSC PS06-WP17.

3.2 Agreed scenarios

Table 1. Definition of scenarios

	Base case (B1)	Base case (B2)	Sensitivity case (S1)	Sensitivity case (S2)
Initial year	1980	Same as left	Same as left	Same as left
Biomass survey	$I_{t,bio} = q_{bio} B_t e^{v_{t,bio}}$ $v_{t,bio} \sim N(0, cv_t^2 + \sigma_{bio}^2)$ $q_{bio} \sim U(0,1)$ (2003-2021)	Same as left	Same as left	Same as left
CPUE	CHN(2013-2020) JPN_early(1980-1993, time-varying q) JPN_late(1994-2020) KOR(2001-2020) RUS(1994-2020) CT(2001-2020) $I_{t,f} = q_f B_t^b e^{v_{t,f}}$ $v_{t,f} \sim N(0, \sigma_f^2)$ $\sigma_f^2 = c \cdot (ave(cv_t^2) + \sigma_{bio}^2)$, where $ave(cv_t^2)$ is computed except for 2020 survey	CHN(2013-2020) JPN_late(1994-2020) KOR(2001-2020) RUS(1994-2020) CT(2001-2020)	JPN_early(1980-1993, time-varying q) Joint CPUE (2001-2020) $I_{t,joint} = q_{joint} B_t^b e^{v_{t,joint}}$ $v_{t,joint} \sim N(0, \sigma_{joint}^2)$ $\sigma_{joint}^2 = c \cdot (ave(cv_t^2) + \sigma_{bio}^2)$, where $ave(cv_t^2)$ is computed except for 2020 survey	Joint CPUE (2001-2020)
Variance component	Variances of logCPUEs are assumed to be common and 6 times of that of log biomass ($c = 6$)	Variances of logCPUEs are assumed to be common and 5 times of that of log biomass ($c = 5$)	Same weight between biomass and joint CPUE	Same as left
Hyper-depletion/stability	A common parameter for all fisheries but JPN_early, with a prior distribution, $b \sim U(0, 1)$ [b for JPN_early is fixed at 1]	A common parameter for all fisheries with a prior distribution, $b \sim U(0, 1)$	$b \sim U(0, 1)$	$b \sim U(0, 1)$
Prior for other than q_{bio}	Own preferred options	Own preferred options	Own preferred options	Own preferred options

Table 2. Description of symbols used in the stock assessment

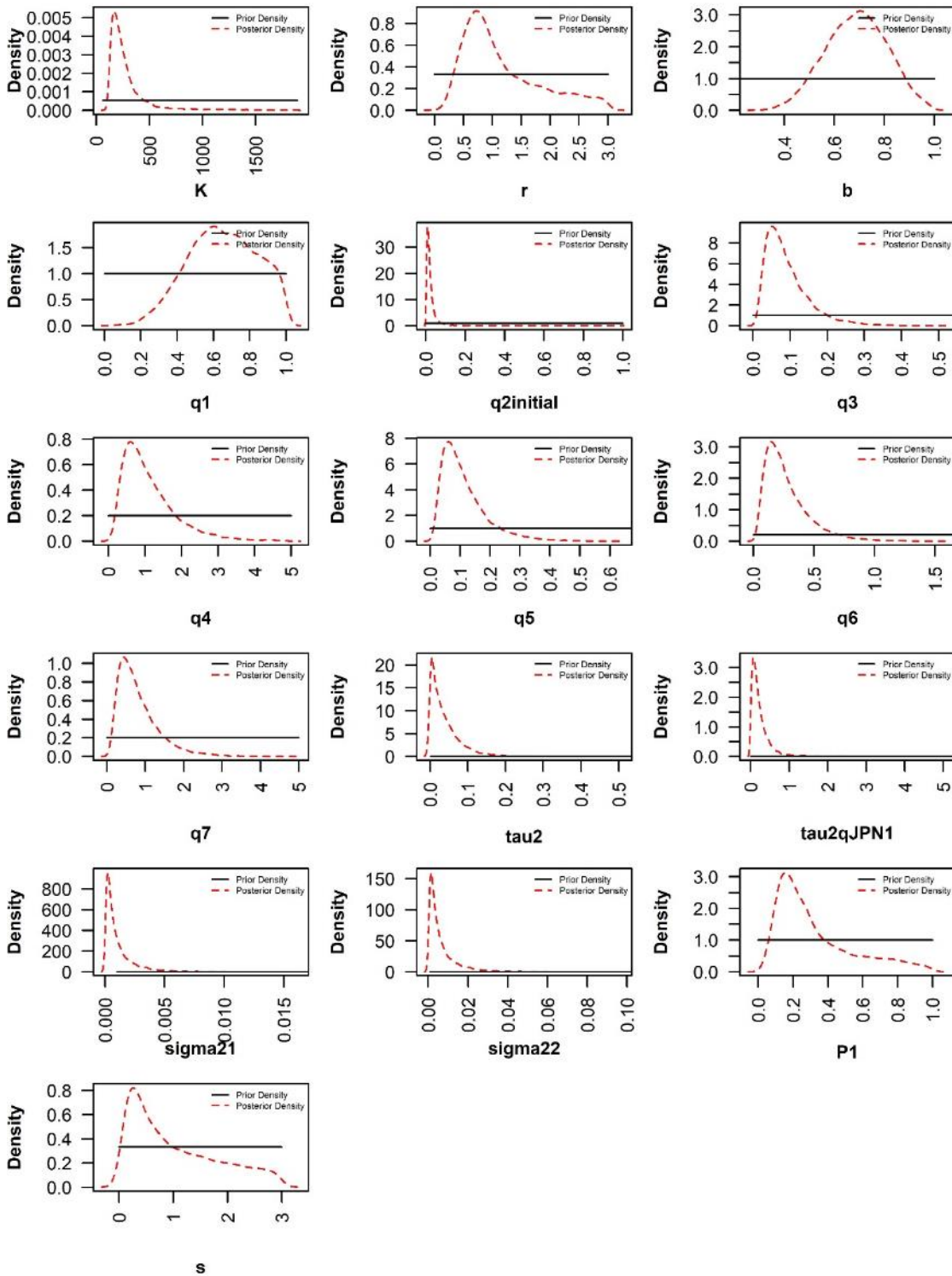
Symbol	Description
C_{2020}	Catch in 2020
$AveC_{2018-2020}$	Average catch for a recent period (2018–2020)
$AveF_{2018-2020}$	Average harvest rate for a recent period (2018–2020)
F_{2020}	Harvest rate in 2020
F_{MSY}	Annual harvest rate producing the maximum sustainable yield (MSY)
MSY	Equilibrium yield at F_{MSY}
F_{2020}/F_{MSY}	Average harvest rate in 2020 relative to F_{MSY}
$AveF_{2018-2020}/F_{MSY}$	Average harvest rate for a recent period (2018–2020) relative to F_{MSY}
K	Equilibrium unexploited biomass (carrying capacity)
B_{2020}	Stock biomass in 2020 estimated in the model
B_{2021}	Stock biomass in 2021 estimated in the model
$AveB_{2019-2021}$	Stock biomass for a recent period (2019–2021) estimated in the model
B_{MSY}	Stock biomass that will produce the maximum sustainable yield (MSY)
B_{MSY}/K	Stock biomass that produces the maximum sustainable yield (MSY) relative to the equilibrium unexploited biomass ^a
B_{2020}/K	Stock biomass in 2020 relative to K^a
B_{2021}/K	Stock biomass in 2021 relative to K^a
$B_{2019-2021}/K$	Stock biomass in the latest time period (2019–2021) relative to the equilibrium unexploited stock biomass ^a
B_{2020}/B_{MSY}	Stock biomass in 2020 relative to B_{MSY}^a
B_{2021}/B_{MSY}	Stock biomass in 2021 relative to B_{MSY}^a
$B_{2019-2021}/B_{MSY}$	Stock biomass for a recent period (2019–2021) relative to the stock biomass that produces maximum sustainable yield (MSY) ^a

^acalculated as the average of the ratios.

4. RESULTS by CHINA, JAPAN and CHINESE TAIPEI

4.1 CHINA

4.1.1 Prior and posterior distributions for Base case model 1 (as an illustrative example)

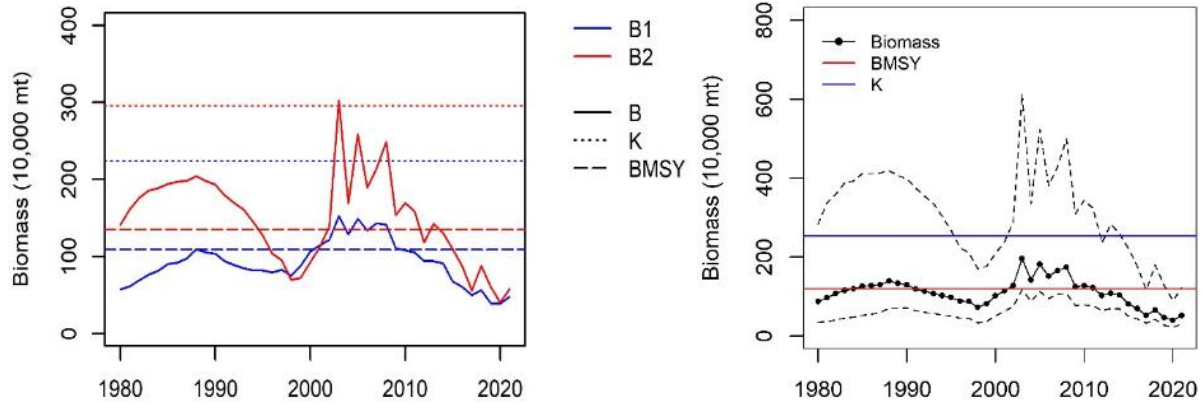


4.1.2 Summary of estimates of parameters and reference points

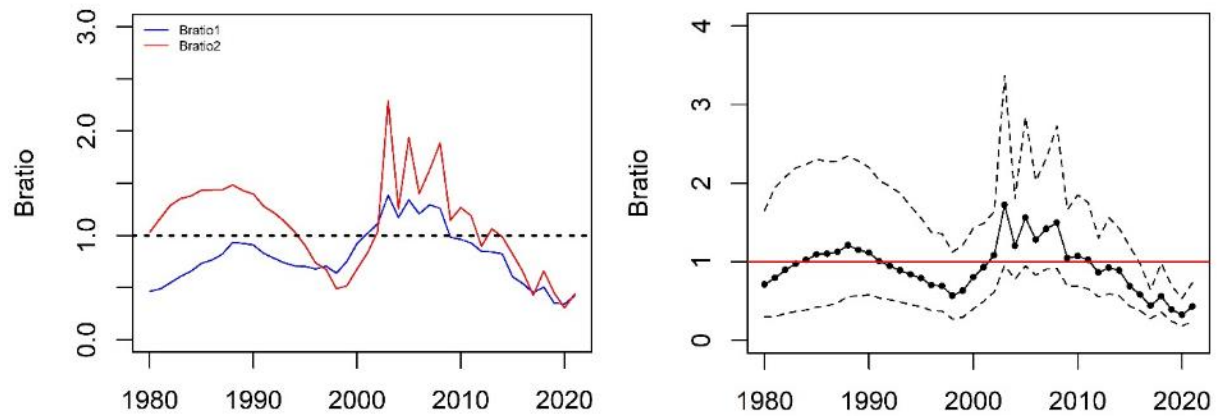
	Base case 1	Base case 2	Over all 2
C2020	13.97	13.97	13.97
AveC2018-2020	25.70	25.70	25.70
AveF2018-2020	0.55	0.40	0.48
F2020	0.36	0.35	0.35
F_{MSY}	0.38	0.36	0.37
MSY	41.78	47.13	43.36
$F2020/F_{MSY}$	0.98	0.99	0.99
$AveF2018-2010/F_{MSY}$	1.47	1.14	1.33
K	224.00	295.40	253.10
B2020	39.07	40.41	39.63
B2021	48.06	58.40	51.79
AveB2019-2021	42.37	53.52	46.32
B_{MSY}	108.90	135.00	119.60
B_{MSY}/K	0.48	0.45	0.46
$B2020/K$	0.17	0.14	0.16
$B2021/K$	0.21	0.21	0.21
$B2019-2021/K$	0.19	0.19	0.19
$B2020/B_{MSY}$	0.35	0.31	0.33
$B2021/B_{MSY}$	0.42	0.44	0.43
$B2019-2021/B_{MSY}$	0.38	0.41	0.39

4.1.3 Time series plots for base case models and aggregated results

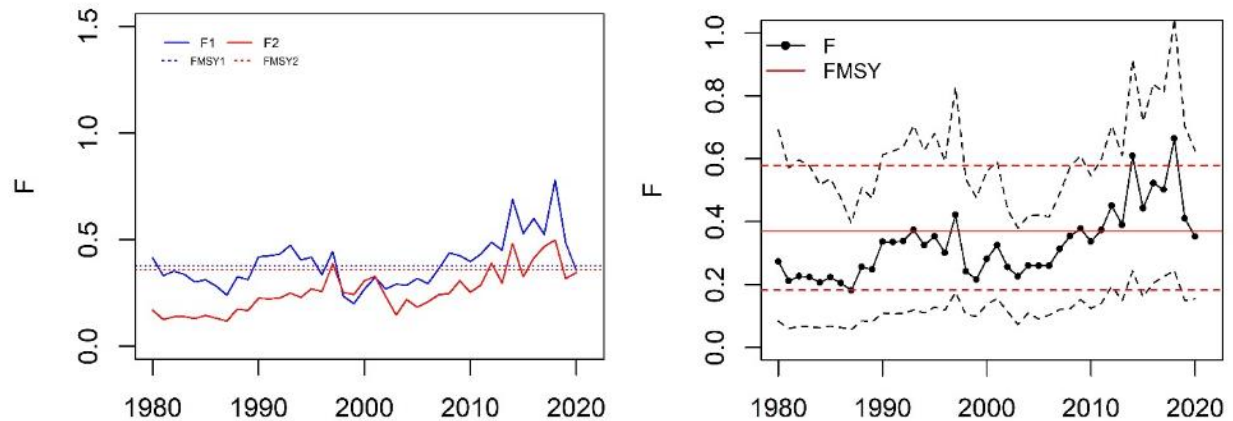
(a) Biomass



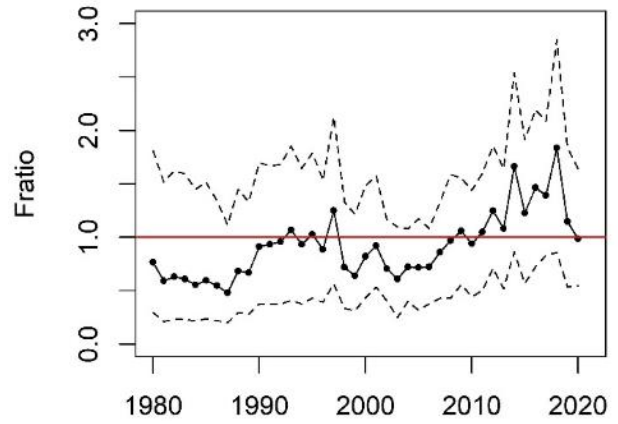
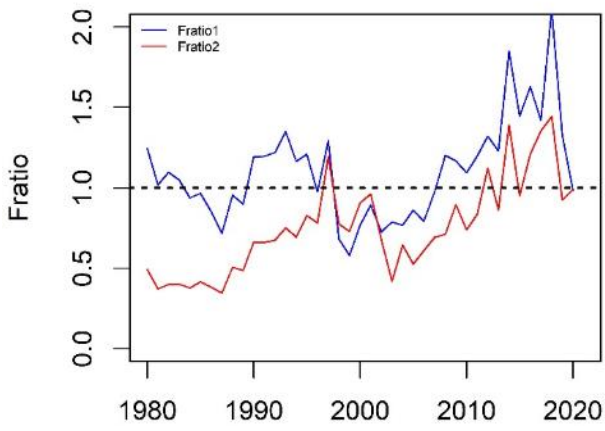
(b) B-ratio (B/B_{MSY})



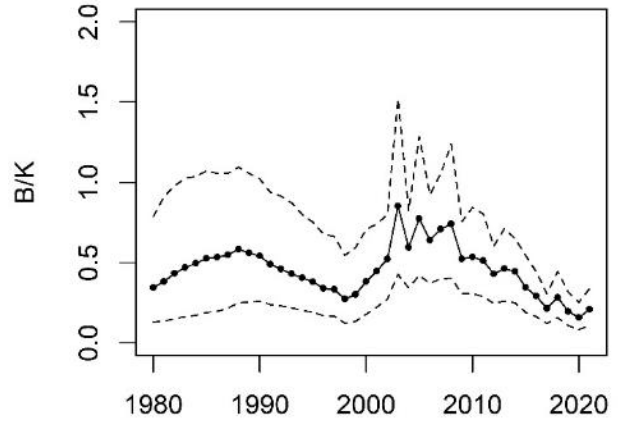
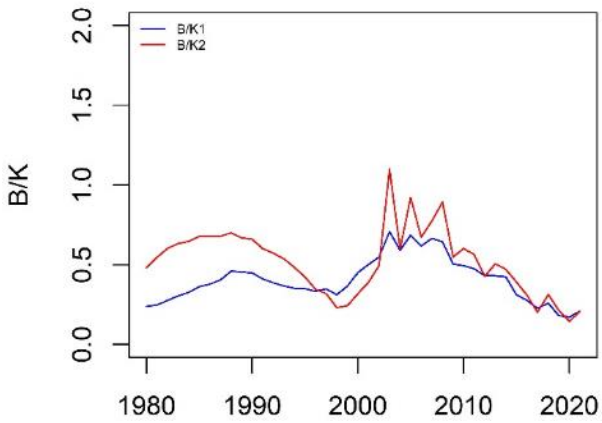
(c) Exploitation rate (F)



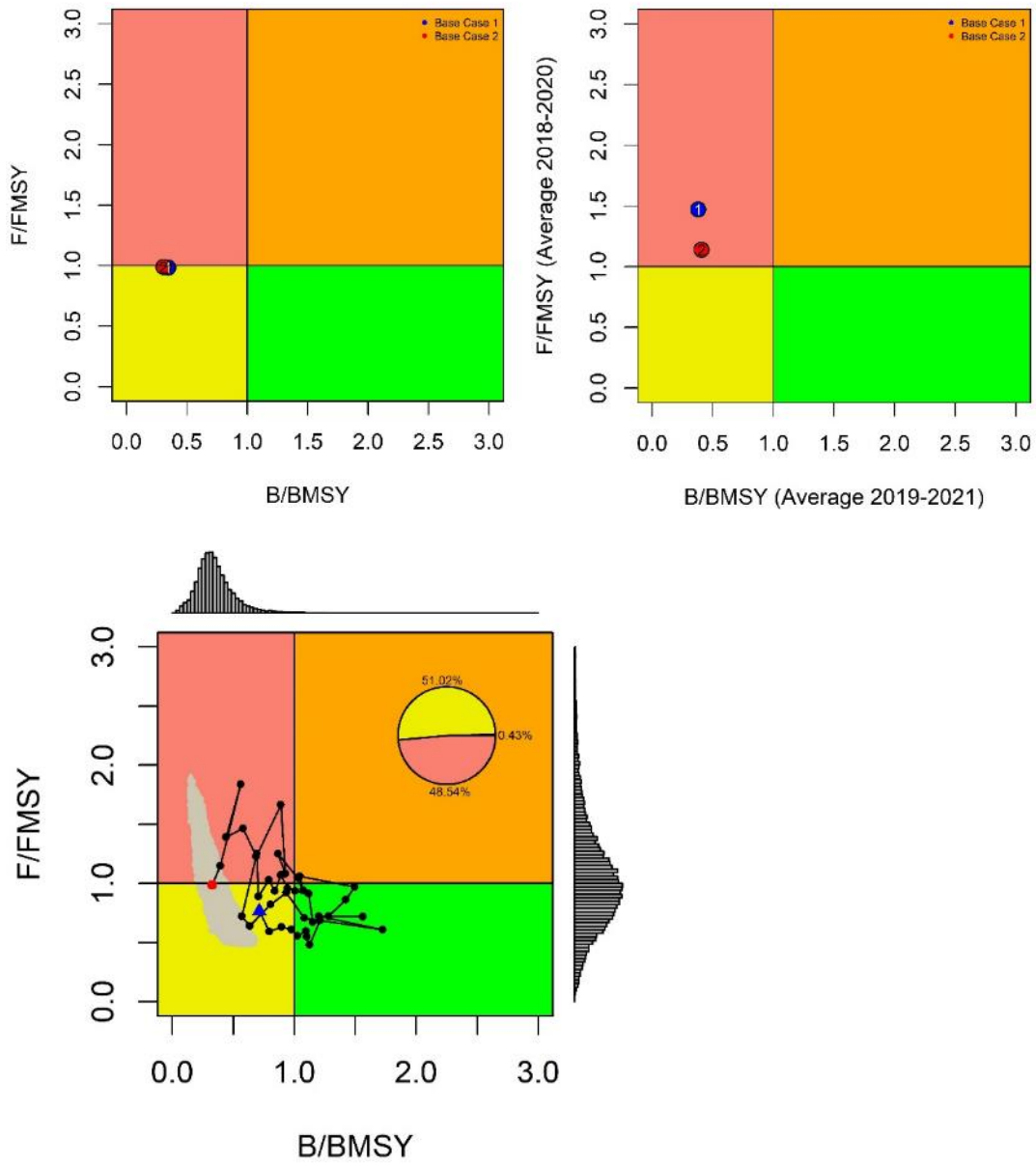
(d) F-ratio (F/F_{MSY})



(e) B/K

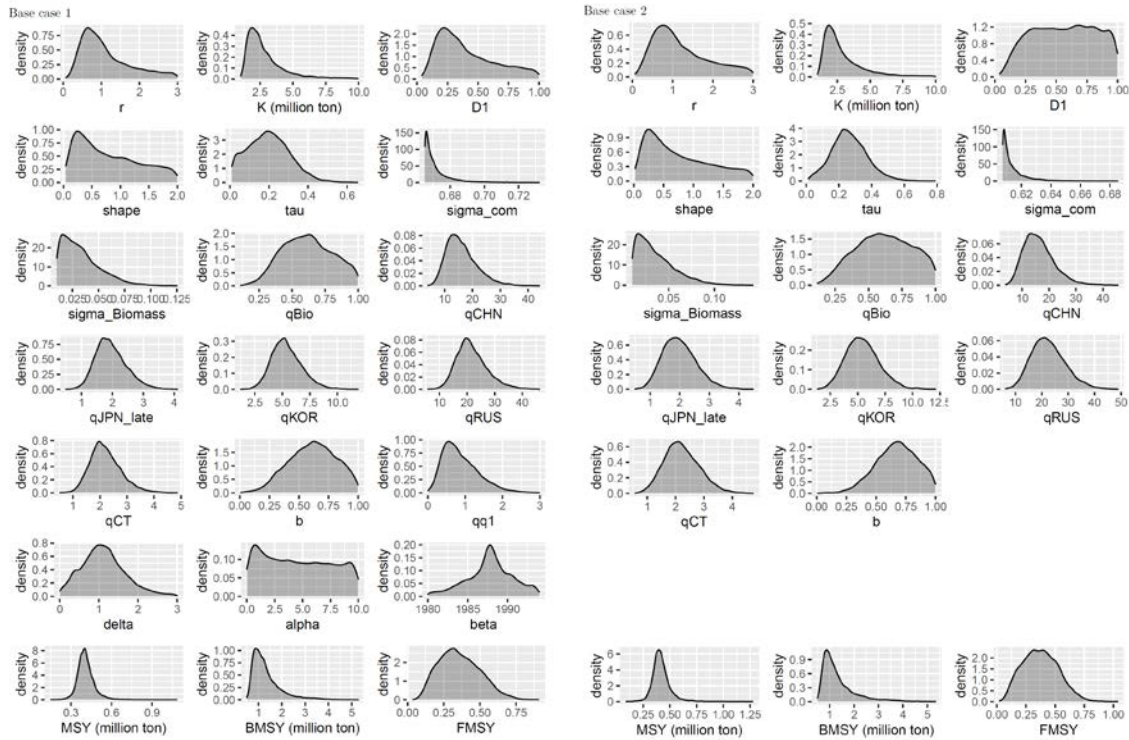


4.1.4 Kobe plots



4.2 JAPAN

4.2.1 Prior and posterior distributions for Base case models



Note: Prior for each free parameter is assumed to be uniform over the shown horizontal range.

4.2.2 Summary of estimates of parameters and reference points

Over the two base cases.

	Mean	Median	Lower10th	Upper10th
C_2020	0.140	0.140	0.140	0.140
AveC_2018_2020	0.257	0.257	0.257	0.257
AveF_2018_2020	0.526	0.515	0.290	0.775
F_2020	0.378	0.355	0.188	0.595
FMSY	0.368	0.357	0.179	0.563
MSY (million ton)	0.415	0.405	0.339	0.498
F_2020/FMSY	1.097	1.033	0.641	1.625
AveF_2018_2020/FMSY	1.543	1.480	0.973	2.187
K (million ton)	2.915	2.421	1.548	4.949
B_2020 (million ton)	0.455	0.393	0.235	0.742
B_2021 (million ton)	0.545	0.480	0.284	0.868
AveB_2019_2021	0.498	0.433	0.274	0.792
BMSY (million ton)	1.336	1.144	0.751	2.189
BMSY/K	0.469	0.463	0.398	0.552
B_2020/K	0.168	0.161	0.094	0.248
B_2021/K	0.205	0.195	0.108	0.314
AveB_2019_2021/K	0.185	0.179	0.106	0.269
B_2020/BMSY	0.358	0.339	0.212	0.526
B_2021/BMSY	0.440	0.412	0.238	0.673
AveB_2019_2021/BMSY	0.396	0.378	0.238	0.574

Base case 1

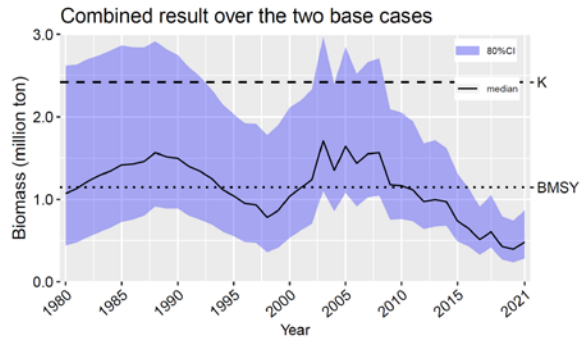
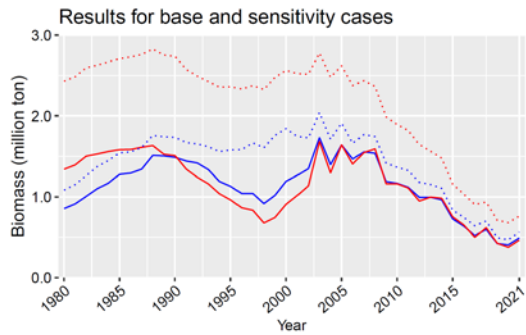
	Mean	Median	Lower10th	Upper10th
C_2020	0.140	0.140	0.140	0.140
AveC_2018_2020	0.257	0.257	0.257	0.257
AveF_2018_2020	0.527	0.516	0.304	0.766
F_2020	0.366	0.344	0.191	0.571
FMSY	0.360	0.346	0.182	0.551
MSY (million ton)	0.411	0.403	0.343	0.483
F_2020/FMSY	1.076	1.019	0.644	1.577
AveF_2018_2020/FMSY	1.567	1.509	1.020	2.191
K (million ton)	2.908	2.439	1.561	4.855
B_2020 (million ton)	0.461	0.406	0.245	0.732
B_2021 (million ton)	0.550	0.493	0.296	0.855
AveB_2019_2021	0.498	0.442	0.281	0.773
BMSY (million ton)	1.339	1.165	0.763	2.150
BMSY/K	0.472	0.467	0.399	0.554
B_2020/K	0.171	0.165	0.098	0.249
B_2021/K	0.208	0.199	0.110	0.316
AveB_2019_2021/K	0.186	0.181	0.108	0.269
B_2020/BMSY	0.363	0.345	0.219	0.529
B_2021/BMSY	0.443	0.417	0.243	0.670
AveB_2019_2021/BMSY	0.396	0.379	0.241	0.569

Base case 2

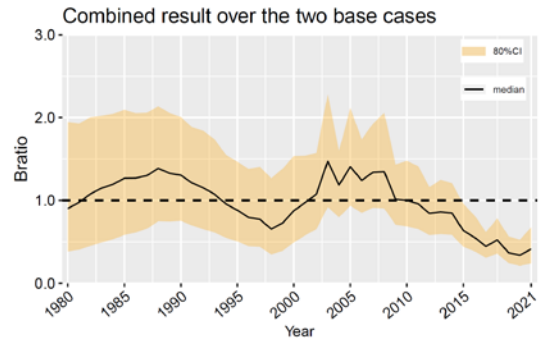
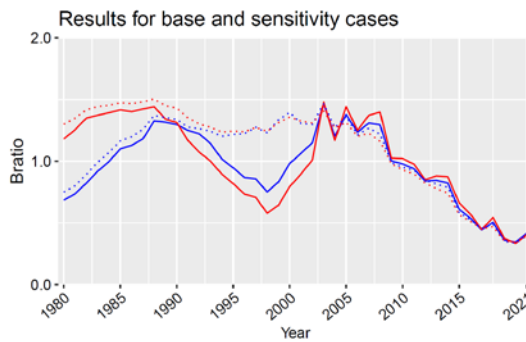
	Mean	Median	Lower10th	Upper10th
C_2020	0.140	0.140	0.140	0.140
AveC_2018_2020	0.257	0.257	0.257	0.257
AveF_2018_2020	0.526	0.515	0.275	0.782
F_2020	0.391	0.370	0.186	0.617
FMSY	0.375	0.370	0.176	0.574
MSY (million ton)	0.418	0.408	0.333	0.514
F_2020/FMSY	1.118	1.050	0.638	1.677
AveF_2018_2020/FMSY	1.519	1.446	0.931	2.185
K (million ton)	2.921	2.395	1.534	5.027
B_2020 (million ton)	0.449	0.377	0.226	0.751
B_2021 (million ton)	0.541	0.466	0.276	0.883
AveB_2019_2021	0.499	0.424	0.267	0.821
BMSY (million ton)	1.333	1.124	0.739	2.245
BMSY/K	0.466	0.459	0.398	0.550
B_2020/K	0.164	0.157	0.091	0.246
B_2021/K	0.203	0.192	0.105	0.311
AveB_2019_2021/K	0.184	0.178	0.105	0.269
B_2020/BMSY	0.354	0.333	0.205	0.523
B_2021/BMSY	0.437	0.406	0.233	0.675
AveB_2019_2021/BMSY	0.397	0.377	0.235	0.579

4.2.3 Time series plots for base case models and aggregated results

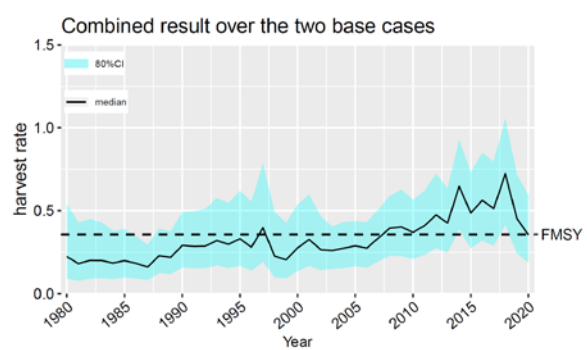
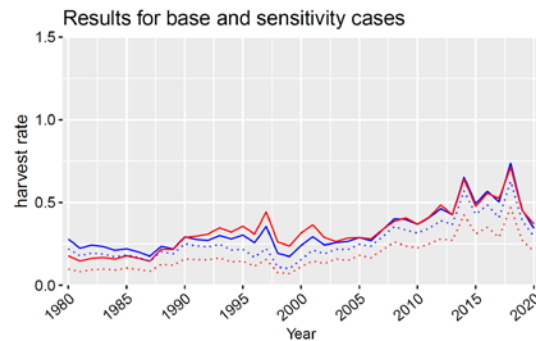
(a) Biomass



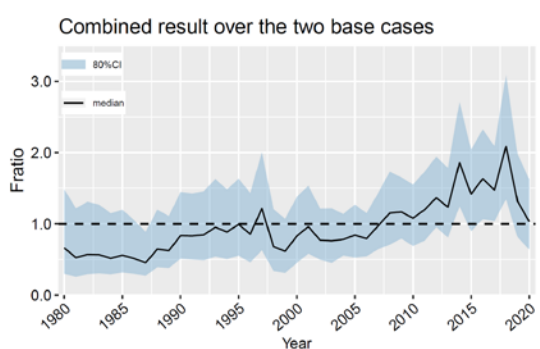
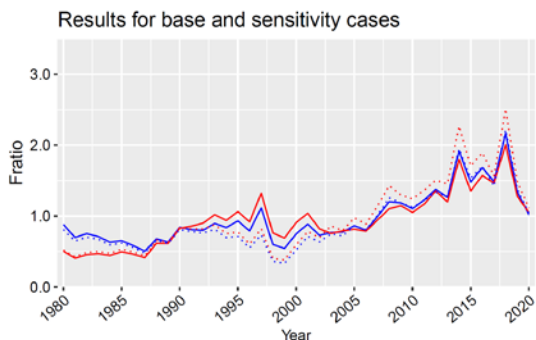
(b) B-ratio (B/B_{MSY})



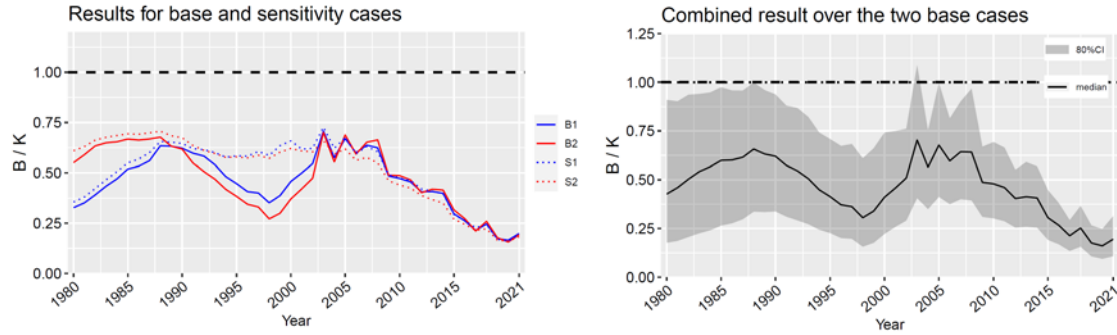
(c) Exploitation rate (F)



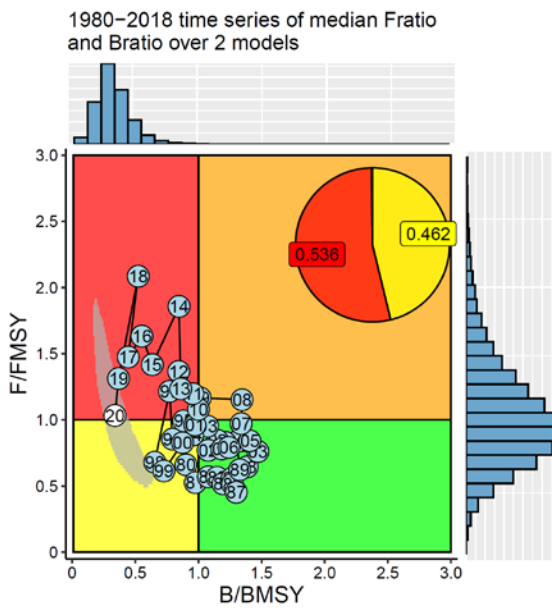
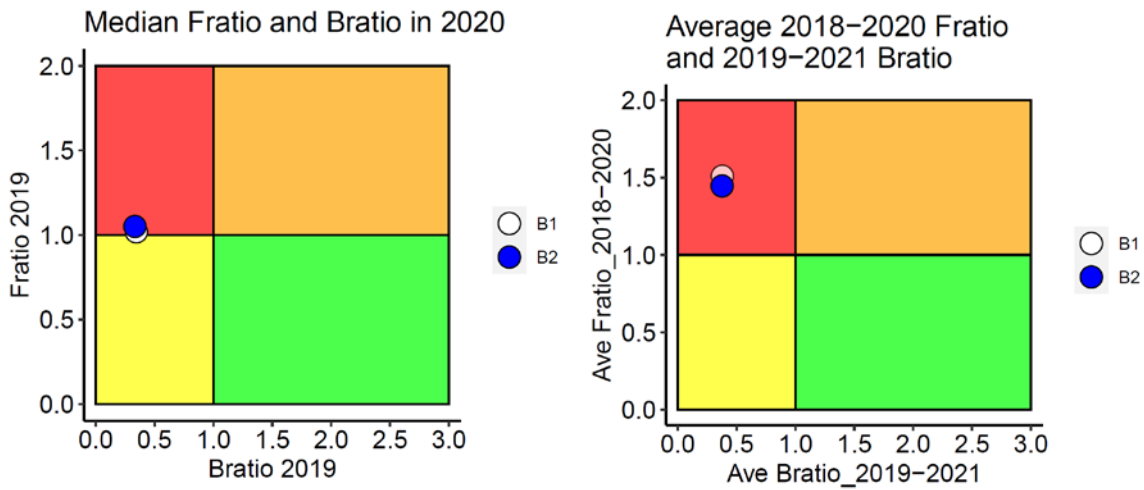
(d) F-ratio (F/F_{MSY})



(e) B/K

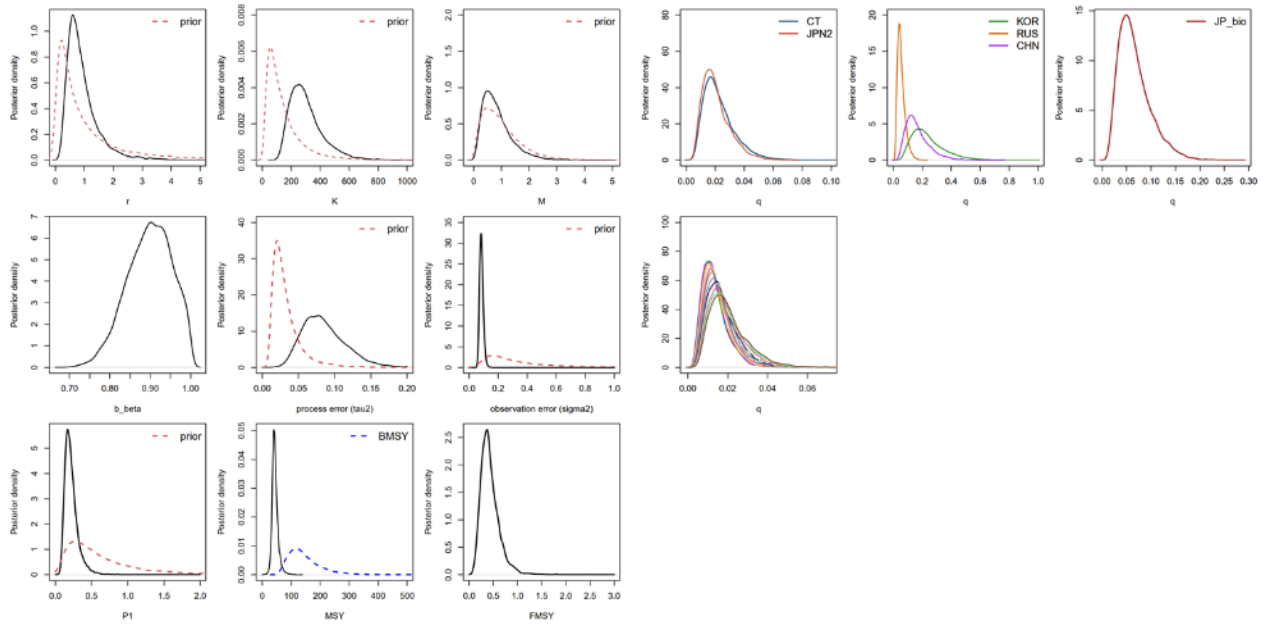


4.2.4 Kobe plots



4.3 CHINESE TAIPEI

4.3.1 Prior and posterior distributions for Base case model 1 (as an illustrative example)



4.3.2 Summary of estimates of parameters and reference points

(a) Base case1

	Mean	Median	Lower 10th	Upper 10th
Catch ₂₀₂₀	13.97	13.97	13.97	13.97
F ₂₀₁₈₋₂₀₂₀	0.39	0.29	0.14	0.69
F ₂₀₂₀	0.29	0.24	0.11	0.51
F _{MSY}	0.43	0.39	0.22	0.67
MSY	44.18	42.65	33.39	56.72
F ₂₀₂₀ /F _{MSY}	0.67	0.62	0.35	1.04
F ₂₀₁₈₋₂₀₂₀ /F _{MSY}	0.88	0.79	0.44	1.37
K	304.74	281.25	179.61	461.70
B ₂₀₂₀	76.34	66.66	34.77	130.09
B ₂₀₂₁	93.50	81.73	42.32	159.49
B ₂₀₁₉₋₂₀₂₁	91.18	79.88	42.12	154.76
B _{MSY}	144.98	132.95	85.58	219.80
B _{MSY} /K	0.48	0.47	0.42	0.55
B ₂₀₂₀ /K	0.24	0.24	0.17	0.33
B ₂₀₂₁ /K	0.30	0.29	0.20	0.41
B ₂₀₁₉₋₂₀₂₁ /K	0.29	0.28	0.21	0.38
B ₂₀₂₀ /B _{MSY}	0.52	0.49	0.34	0.72
B ₂₀₂₁ /B _{MSY}	0.63	0.61	0.41	0.90
B ₂₀₁₉₋₂₀₂₁ /B _{MSY}	0.62	0.59	0.42	0.84

(b) Base case2

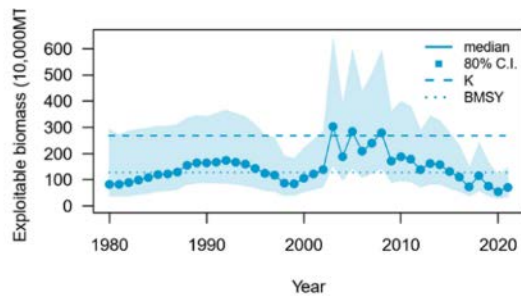
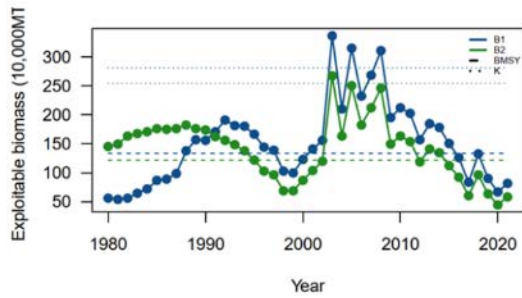
	Mean	Median	Lower 10th	Upper 10th
Catch ₂₀₂₀	13.97	13.97	13.97	13.97
F ₂₀₁₈₋₂₀₂₀	0.78	0.46	0.17	1.32
F ₂₀₂₀	0.58	0.38	0.15	0.96
F _{MSY}	0.49	0.43	0.21	0.82
MSY	43.11	41.62	31.86	55.61
F ₂₀₂₀ /F _{MSY}	1.10	0.94	0.49	1.71
F ₂₀₁₈₋₂₀₂₀ /F _{MSY}	1.42	1.16	0.57	2.34
K	287.27	254.50	157.01	465.07
B ₂₀₂₀	54.88	44.33	22.68	99.79
B ₂₀₂₁	74.02	58.76	30.59	135.89
B ₂₀₁₉₋₂₀₂₁	69.57	55.68	29.10	127.17
B _{MSY}	137.84	122.25	75.63	221.40
B _{MSY} /K	0.48	0.48	0.42	0.55
B ₂₀₂₀ /K	0.18	0.18	0.12	0.26
B ₂₀₂₁ /K	0.25	0.24	0.16	0.36
B ₂₀₁₉₋₂₀₂₁ /K	0.23	0.23	0.15	0.32
B ₂₀₂₀ /B _{MSY}	0.39	0.36	0.24	0.56
B ₂₀₂₁ /B _{MSY}	0.52	0.49	0.32	0.77
B ₂₀₁₉₋₂₀₂₁ /B _{MSY}	0.49	0.46	0.31	0.70

(c) Joint estimates of the base cases 1 and 2

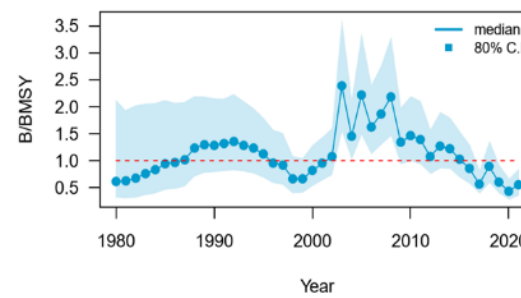
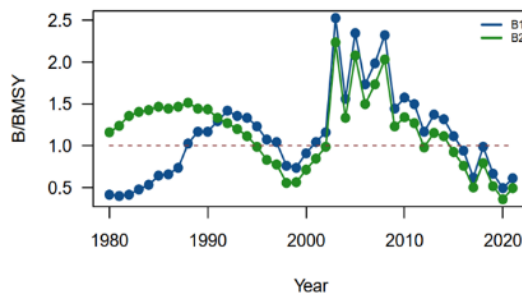
	Mean	Median	Lower 10th	Upper 10th
Catch ₂₀₂₀	13.97	13.97	13.97	13.97
F ₂₀₁₈₋₂₀₂₀	0.59	0.36	0.15	0.99
F ₂₀₂₀	0.43	0.29	0.13	0.75
F _{MSY}	0.46	0.41	0.21	0.75
MSY	43.65	42.14	32.69	56.18
F ₂₀₂₀ /F _{MSY}	0.88	0.75	0.4	1.42
F ₂₀₁₈₋₂₀₂₀ /F _{MSY}	1.15	0.94	0.48	1.9
K	296	268.4	166.6	463.3
B ₂₀₂₀	65.61	55.2	26.38	117.67
B ₂₀₂₁	83.76	70.37	34.81	149.2
B ₂₀₁₉₋₂₀₂₁	80.37	67.94	33.56	143.16
B _{MSY}	141.41	127.7	79.98	220.2
B _{MSY} /K	0.52	0.47	0.29	0.79
B ₂₀₂₀ /K	0.21	0.21	0.13	0.3
B ₂₀₂₁ /K	0.27	0.27	0.17	0.39
B ₂₀₁₉₋₂₀₂₁ /K	0.26	0.26	0.17	0.36
B ₂₀₂₀ /B _{MSY}	0.45	0.43	0.27	0.66
B ₂₀₂₁ /B _{MSY}	0.58	0.55	0.35	0.85
B ₂₀₁₉₋₂₀₂₁ /B _{MSY}	0.55	0.53	0.35	0.79

4.3.3 Time series plots for base case models and aggregated results

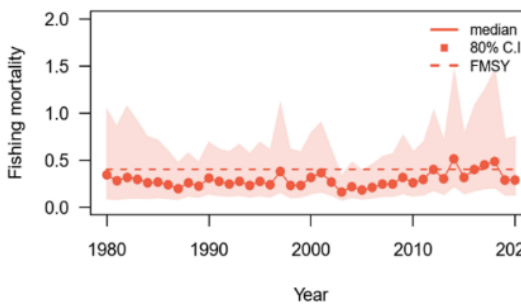
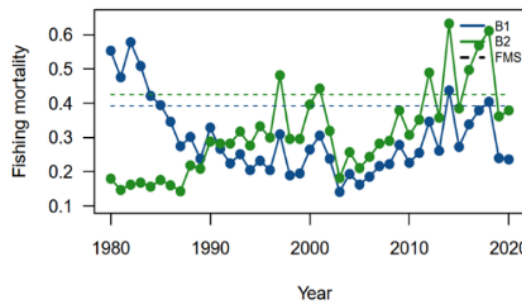
(a) Biomass



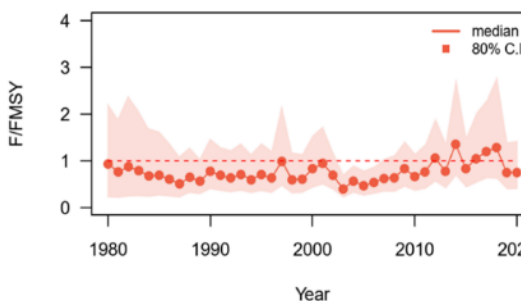
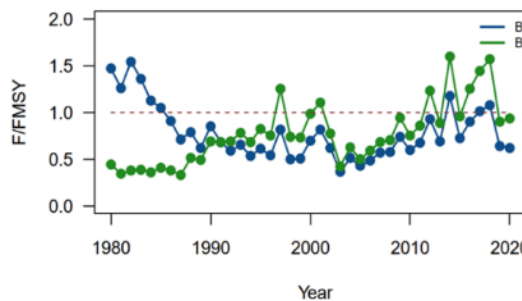
(b) B-ratio (B/B_{MSY})



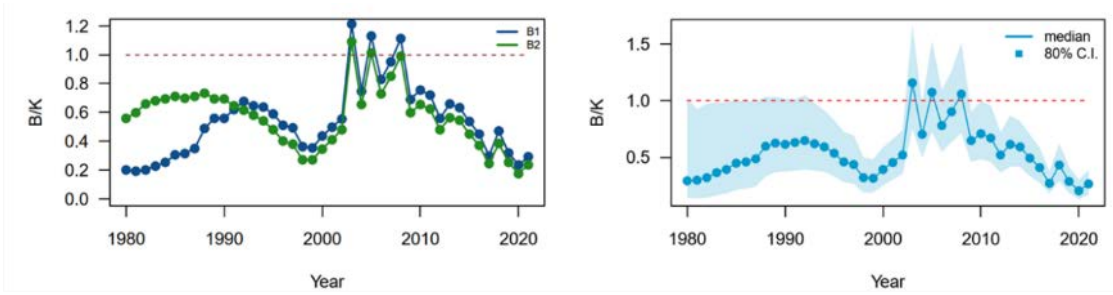
(c) Exploitation rate (F)



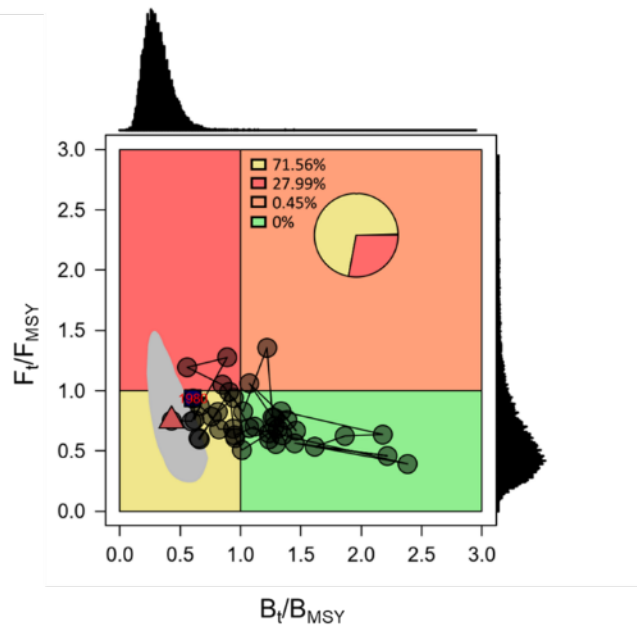
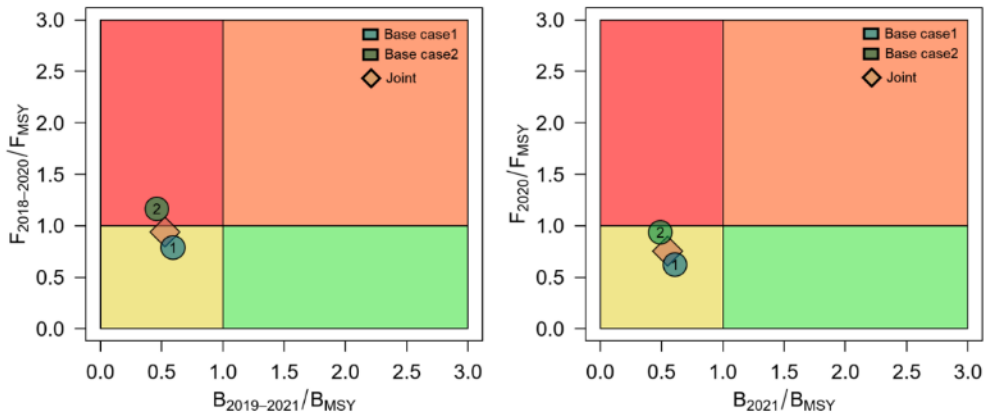
(d) F-ratio (F/F_{MSY})



(e) B/K



4.3.4 Kobe plots



5 SOME AGGREGATED RESULTS FOR VISUALIZATION PURPOSE

5.1 Visual presentation of results

The graphical presentations for times series of biomass (B), B-ratio (B/B_{MSY}), exploitation rate (F), F-ratio (F/F_{MSY}) and B/K are shown in Figure 3.

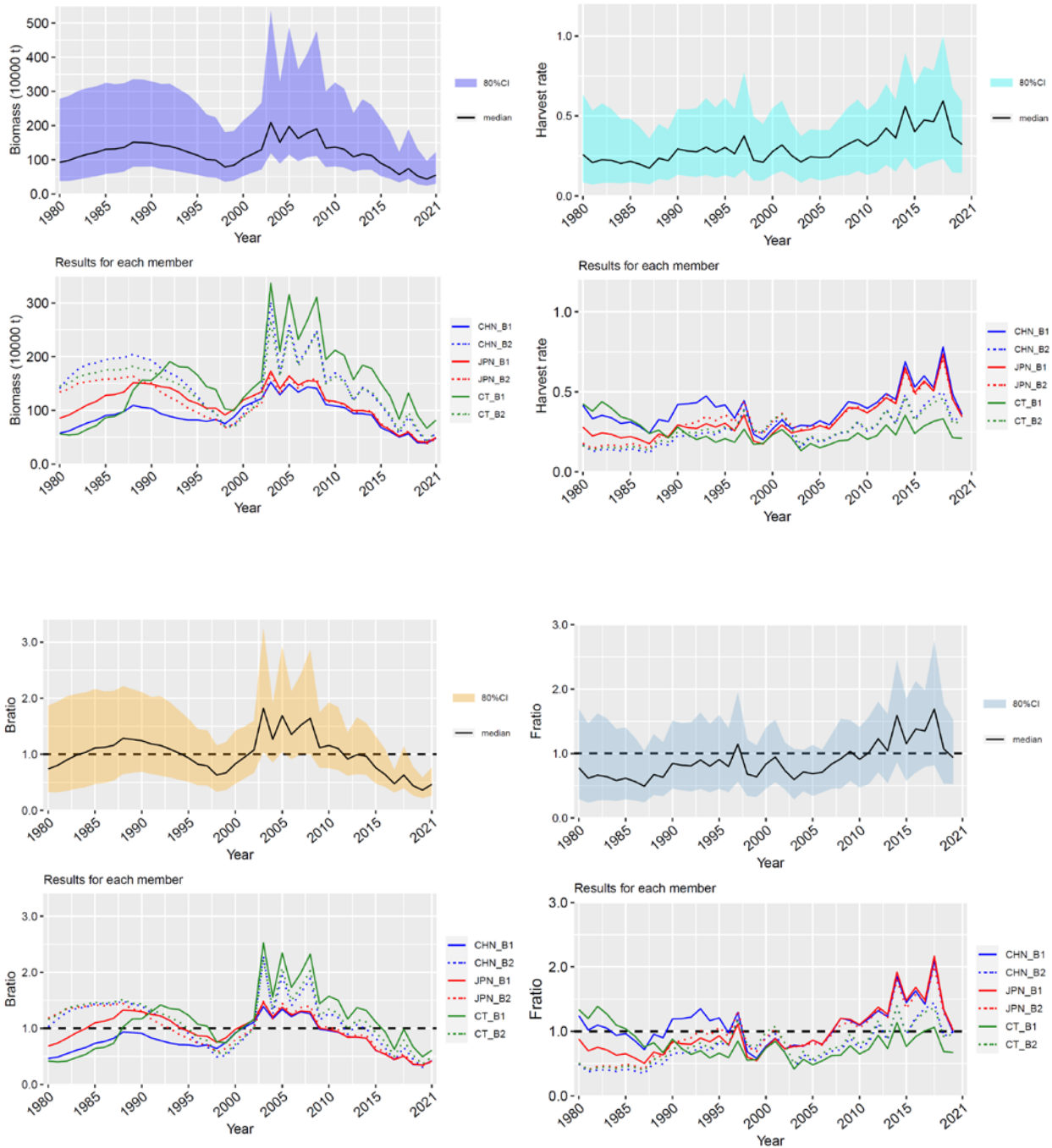


Figure 3. Time series of median estimated values of six runs for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K. The solid and shaded lines correspond to B1 and B2, respectively.

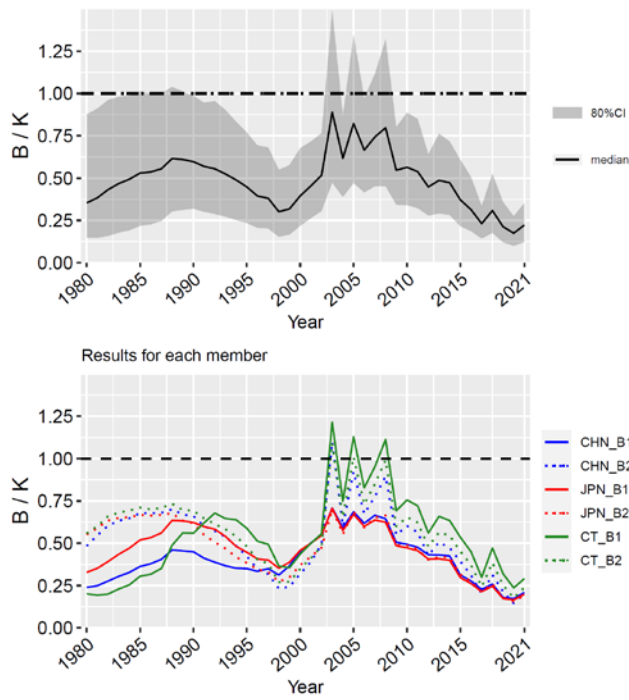


Figure 3 (Continued).

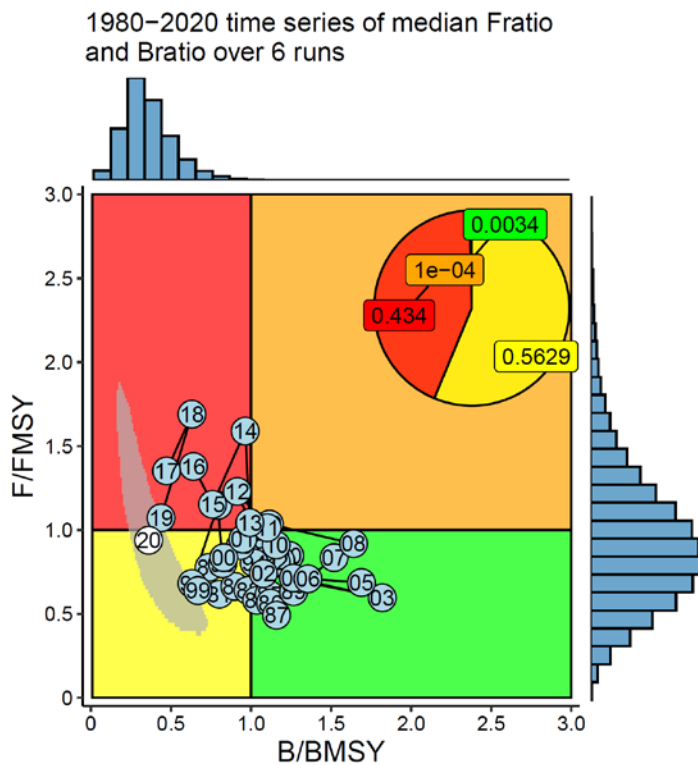


Figure 4. Kobe plot with time trajectory. The data are aggregated across 6 model results (2 base-case models by 3 Members).

5.2 Summary table

Table 3. Summary of estimates of reference quantities. Median values are reported.

	Median	Lower10%	Upper10%	Median_CHN	Median_JPN	Median_CT
C_2020 (10000 t)	13.968	13.968	13.968	13.968	13.968	13.968
AveC_2018_2020 (10000 t)	25.704	25.704	25.704	25.704	25.704	25.704
AveF_2018_2020	0.435	0.180	0.743	0.482	0.515	0.298
F_2020	0.322	0.144	0.590	0.353	0.355	0.253
FMSY	0.352	0.185	0.559	0.370	0.357	0.334
MSY	41.901	33.956	56.291	43.358	40.529	42.145
F_2020/FMSY	0.938	0.523	1.529	0.986	1.033	0.794
AveF_2018_2020/FMSY	1.247	0.647	1.967	1.334	1.480	0.936
K (10000 t)	255.121	157.185	517.839	253.100	242.055	268.400
B_2020 (10000 t)	43.415	23.680	96.706	39.625	39.345	55.200
B_2021 (10000 t)	54.774	30.260	122.400	51.790	47.993	70.355
AveB_2019_2021 (10000 t)	50.173	28.629	115.984	46.317	43.323	67.935
BMSY (10000 t)	120.784	76.740	236.751	119.600	114.410	127.700
BMSY/K	0.465	0.389	0.577	0.461	0.463	0.471
B_2020/K	0.175	0.099	0.275	0.159	0.161	0.208
B_2021/K	0.223	0.123	0.353	0.209	0.195	0.265
AveB_2019_2021/K	0.207	0.120	0.319	0.191	0.179	0.255
B_2020/BMSY	0.361	0.218	0.587	0.327	0.339	0.428
B_2021/BMSY	0.463	0.264	0.765	0.432	0.412	0.550
AveB_2019_2021/BMSY	0.427	0.260	0.693	0.390	0.378	0.528

6 CONCLUDING REMARKS

Results of combined model estimates indicate that the stock declined with an interannual variability from near carrying capacity in the mid-2000's after a period of high productivity to current low levels. Exploitation rates were increasing slowly since 2005 except for 2019. The results also indicated that B was below B_{MSY} (median average B/B_{MSY} during 2019-2021 = 0.427, 80%CI=0.260-0.693) and F was above F_{MSY} (average F/F_{MSY} during 2018-2020 = 1.247, 80%CI= 0.647-1.967). The results further indicated that stock biomass fell to the lowest value since 1980 in 2020 (median B/B_{MSY} = 0.361, 80%CI=0.218-0.587) and has been still at a historically low level in recent years (2019-2021). Information of the nominal CPUE series further indicated that Pacific saury stock biomass has likely been near a record low level in 2021.

HCR and reference points have not yet been established for Pacific saury although an HCR is needed and research is expected to begin this year. The Commission used F_{MSY} catch in place of an HCR to set the TAC for 2020 ($TAC = F_{MSY} \times Biomass$). According to special comment #4 in the 2020 stock assessment “the F_{MSY} catch approach resulted in a TAC for 2020 that was substantially larger than the actual catch” and “TAC values could be calculated using the F_{MSY} estimate and historical biomass estimates from the BSSPM for comparison to actual catches”.

Results from the suggested calculations for 2020 based on updated estimates differ because the 2020 F_{MSY} catch is only slightly larger than the observed catch (Figure 5). The difference is probably due to uncertainty in the scale of estimated biomass and trend for terminal years.

Based on the updated figures, F_{MSY} catch levels were higher than actual catch during 1980-2010, lower during 2011-2017 and 2021 and nearly the same during 2018-2019. In 2014 and 2018 catch was substantially higher than the F_{MSY} catch level. Thus, biomass was relatively high prior to 2011 while catches were less than F_{MSY} catch and biomass declined to a historical low during 2011-2021 while catches were usually greater than or equal to F_{MSY} catch. Based on these results, catches generally exceeded the F_{MSY} catch level and contributed to the recent decline in biomass.

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Updated total catch, CPUE standardizations and biomass estimates for the stock assessment of Pacific saury

Year	Total catch (metric tons)	Biomass		CPUE_	CPUE	CPUE	CPUE	CPUE	CPUE	Joint CPUE (VAST)
		JPN (VAST, 1000 metric tons)	CV (%)	CHN (metric tons per vessel per day)	JPN_early (metric tons per net haul)	JPN_late (metric tons per net haul)	KOR (metric tons per vessel per day)	RUS (metric tons per vessel per day)	CT (metric tons per net haul)	
1980	238510				0.72					
1981	204263				0.63					
1982	244700				0.46					
1983	257861				0.87					
1984	247044				0.81					
1985	281860				1.4					
1986	260455				1.13					
1987	235510				0.97					
1988	356989				2.36					
1989	330592				3.06					
1990	435869				1.95					
1991	399017				3.13					
1992	383999				4.32					
1993	402185				3.25					
1994	332509					3.19		16.89		
1995	343743					2.03		20.15		
1996	266424					1.69		16.15		
1997	370017					3.31		11.74		
1998	176364					1.03		12.49		
1999	176498					0.78		12.61		
2000	286186					1.22		17.31		
2001	370823					1.46	3.82	21.05	1.57	0.72
2002	328362					1.07	3.13	20.01	1.63	0.63
2003	444642	1939.9	29.0			2.00	5.93	35.76	2.67	1.21
2004	369400	652.6	20.7			2.52	4.78	47.10	1.45	1.04
2005	473907	1228.3	30.4			3.96	9.97	49.50	2.39	1.72
2006	394093	744	27.0			3.59	8.22	34.57	1.27	0.78

Annex H:SC06 Report

2007	520207	878.4	27.4		3.77	7.15	43.21	2.37	1.24
2008	617509	1129.2	28.8		4.29	10.69	42.31	2.91	1.68
2009	472177	619.2	24.6		4.00	4.37	21.26	1.57	0.99
2010	429808	797.9	27.5		1.57	8.02	23.68	1.94	0.92
2011	456263	730.2	32.6		2.21	4.74	28.49	2.51	1.24
2012	460544	452.5	23.5		2.38	3.86	24.36	2.47	1.06
2013	423790	680.4	25.7	13.96	1.66	4.67	22.20	2.79	0.85
2014	629576	506.7	23.0	16.24	2.74	8.01	25.37	3.63	1.36
2015	358883	516.2	21.3	17.73	1.66	3.4	16.52	2.42	0.84
2016	361688	396.4	28.1	9.29	1.74	5.47	18.17	2.43	0.75
2017	262639	192.8	27.9	8.5	1.11	3.36	8.59	1.83	0.85
2018	439079	424.9	27.0	15.84	1.76	5.25	26.06	3.09	1.37
2019	192377	347.2	27.3	6.89	0.64	3.37	8.39	1.41	0.45
2020	139676	109.5	158.1	5.95	0.35	2.45	7.19	1.24	0.29
2021		265.8	33.1						

Scientific projects

#	Project	Time	Status	Next step: activities, required funds
1.1	GIS database/module as a part of NPFC database management system for spatial management of bottom fisheries and VMEs	2018-	<i>In progress</i> A map of bottom fishing footprint has been deployed on UAT website for members' review and input.	Further development of the map. <i>2022 FY: 0,55mln JPY (5,000USD).</i> <i>Source: SC fund.</i>
1.2	Joint spatial/temporal map of Members' catch and effort on Pacific saury with a spatial resolution of one-degree grids and a temporal resolution of one month	2018-	<i>In progress.</i> Spatial/temporal map of Members' Pacific saury catch and effort has been updated up to 2020.	Update the map up to 2021. <i>2022 FY: 0,15mln JPY (1,500USD).</i>
2	Pacific saury stock assessment meeting (meeting costs)	Every year	<i>TWG PSSA meetings: Feb 2017, Dec 2017, Nov 2018, Mar 2019.</i> <i>SSC PS meetings: Nov 2019, Nov 2020.</i>	SSC PS09 meeting, 30 Aug - 2 Sep 2022. <i>2022 FY: 1.65mln JPY (15,000USD)</i> <i>Source: SC fund.</i>
3	Chub mackerel stock assessment meeting (meeting costs)	Every year	<i>TWG CMSA meetings: Dec 2017, Mar 2019, Nov 2020.</i>	TWG CMSA05 meeting, 16-19 May 2022. <i>2022 FY: 1.65mln JPY (15,000USD)</i> <i>Source: SC fund.</i>
4	Expert to review Pacific saury stock assessment (consultant fee and travel costs)	TBD	Under consideration. SSC PS: to determine time and format.	<i>2021-2022 FY: No funds required.</i>

5	Observer Program	2018-	<p><i>In progress</i></p> <p>A study on the existing observer programs of Members and those of other RFMOs has been done.</p> <p>Scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means for Pacific saury have been reviewed.</p>	<p>Identify data gaps which can be fulfilled by an observer program.</p> <p><i>2021-2022 FY: No funds required.</i></p>
6	Promotion of cooperation with NPAFC including macro-scale multinational survey in the North Pacific in 2022	2021-2022	<p><i>In progress.</i></p> <p>The SC has provided suggestions to the research program of the NPAFC/IYS pan-Pacific survey which will be held in winter-spring 2022.</p>	<p>Review SC-related sections of the Work Plan to implement NPFC/NPAFC Memorandum of Cooperation.</p> <p><i>2022 FY: No funds required.</i></p>
7	Invited expert for the development of the operating model for chub mackerel stock assessment (consultant fee and travel costs)	2020-	<p>An external expert has been contracted to support the TWG CMSA in testing candidate stock assessment models.</p>	<p><i>2022 FY: 1,1mln JPY (10,000USD)</i></p> <p><i>Source: SC fund.</i></p>
8	Invited expert to stock assessment meetings of Pacific saury (consultant fee and travel costs)	2019-	<p><i>External expert attended TWG PSSA/SSC PS meetings in 2019, 2020 and 2021.</i></p>	<p><i>2022 FY: 1,1mln JPY (10,000USD)</i></p> <p><i>Source: SC fund.</i></p>

9	International Course for NPFC observers for VME indicator taxa identification (consultant fees and travel costs for two lecturers, meeting costs)	2022	<i>In preparation. PICES committed to 15,000USD to support the meeting logistics, travel support for 1-2 experts and travel support for ~10 students (subject to the format of the meeting).</i>	Time and location: 3-4 days. Russia, Vladivostok. 2022 FY: 1,65mln JPY (15,000USD). Source: SC fund.
10	Standardization of bycatch species list and fish species identification guides (translation of the existing fish ID guide from Japanese to additional languages)	2019-2020	<i>In progress. Bycatch species list has been compiled. The translation and review of the fish ID guide is in progress.</i>	Printing costs. 2022 FY: 1.1mln JPY (10,000USD). Source: SC fund.
11	2022 PICES Annual meeting	Every year		<i>Travel support to a participant of the SC or its subsidiary bodies.</i> 2022 FY: 0.45mln JPY (4,000USD) Source: SC fund.
12	PICES-ICES-FAO Small Pelagic Fish Symposium, 7-11 November 2022, Lisbon, Portugal.	2022	Funds have been remitted to PICES. Three NPFC experts TBD.	2021 FY: 1.65mln JPY (15,000USD) to the organizers for the symposium logistics 2022 FY: 1.3mln JPY (12,000USD) for travel support for three NPFC experts to attend the symposium. Source: SC fund.

13	Two-day workshop on “Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions”, PICES-2022 meeting, Busan, Korea.	2022	<i>Proposed.</i> Invited speaker TBD.	2022 FY: 0,55mln JPY (5,000USD) to the organizers for the travel support of an invited speaker and workshop logistics. <i>Source: SC fund.</i>
14	A topic session “Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management”, PICES-2022 meeting, Busan, Korea.	2022	<i>Proposed.</i> Invited speaker TBD.	2022 FY: 0,45mln JPY (4,000USD) for the travel support of an invited speaker. <i>Source: SC fund.</i>
	Total			2022 FY: 11.7mln JPY

Past projects

#	Project	Time	Status	Next step: activities, required funds
1	NPFC/FAO VME workshop	2018-2019	<i>Concluded.</i>	

2	Workshop to address data requirements and data sharing for SAI assessment and other tasks identified in the Work Plan by SSC VME and SSC BF	2018	<i>Concluded.</i>	
3	Workshop on biological reference points (BRP), harvest control rule (HCR) and management strategy evaluation (MSE)	2019	<i>Concluded.</i>	
4	Literature review of target and limit reference points used in pelagic species fisheries by other general RFMOs and other fishery management bodies	2018	<i>Done. Available on the NPFC website.</i>	
5	Joint PICES-NPFC workshop (W11) on <i>The influence of environmental changes on the potential for species distributional shifts and subsequent consequences for estimating abundance of Pacific saury</i>	2019	<i>Concluded.</i>	
6	VME taxa identification guide	2017-2022	<i>Concluded.</i> VME taxa ID guide has been printed out and distributed to Members.	Test the VME taxa ID guide by observers and revise if needed.

Annex P

Five-year Work Plan (2021–2025) to implement NPAFC/NPFC Memorandum of Cooperation

Exchange of data and information in accordance with the information-sharing and data confidentiality policies of each Commission;

- Create a SharePoint inter-commission communication system to share news, reports, guideline documents, and other information relevant to the management of the mutual area of interest in an easily accessible form.

Timeline	Deliverables	Milestones
August 2021–June 2022	NPAFC/NPFC Sharepoint Terms of Reference to describe structure, capabilities, access rights, and control issues NPAFC/NPFC Sharepoint service in a test mode NPAFC/NPFC Sharepoint service in full operational mode	Terms of Reference (ToR) agreed by both commissions – September 15, 2021 Test mode – December 31, 2021 Full operational mode – June 30, 2022

- Establish a mechanism of general information exchange (e.g., MCS activity information, fleet activity information, map of catch and fishing efforts).

Timeline	Deliverables	Milestones
August 2021–December 2022	NPAFC/NPFC communication and information exchange plan Regular mutual email conferences to exchange MCS and enforcement activities information	A plan agreed by the commissions – First half of 2022 Summer–autumn of 2022
2022–2025	NPFC historical footprint (catch and fishing efforts) of the fisheries	Pacific saury – available on the NPFC website Japanese sardine – ...

	<p>Annual data reporting/sharing of Pacific salmon as by-catch by NPFC fishing vessels</p> <p>Interactive Mapping System (IMS) for the INPFC/NPAFC High-Seas Salmonid Tag-Recovery Database</p>	<p>Mackerel – ...</p> <p>Japanese flying squid – ...</p> <p>IMS in a test mode with limited access – May 2022.</p> <p>IMS in full operational mode – May 2023</p>
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- Establish a practice of sharing information on suspicious fishing vessels identified in overlapping convention area including stateless vessels and unregistered vessels.

Timeline	Deliverables	Milestones
August 2021–June 2022	Vessel of Interest folder which has been treated as confidential at the NPAFC/NPFC Sharepoint	<p>Vessel of Interest folder description is included in the ToR agreed by the commissions – September 15, 2021</p> <p>Vessel of Interest information is included in the folder – June 30, 2022</p>

Collaboration on research efforts relating to stocks and species of mutual interest, including stock assessments;

- Implement Pan-Pacific research survey plans in winter 2022, organize a comprehensive study of its outcome at the special session of the IYS Synthesis Symposium.

Timeline	Deliverables	Milestones
August 2021–February 2022	<p>NPFC proposal to the Pan-Pacific High Seas Research Expedition cruise plans</p> <p>NPFC participation in the country leads meetings to coordinate/contribute to the</p>	<p>NPFC proposal submitted to the NPAFC – November 2021</p> <p>[Status: The proposal was presented at the NPFC country leads meeting on 13</p>

	Expedition plans	<p>October and then revised by the NPFC SC following the feedback from the meeting.]</p> <p>NPFC Science Manager / Scientific Committee Chairperson participates in the country leads meetings in August 2021–February 2022</p> <p>NPAFC presents a report on the expedition finding after its completion in 2022</p>
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- ~~Harmonize-Coordinate research activities identified in~~ the NPFC/PICES and NPAFC/PICES Frameworks for Enhanced Scientific Cooperation in the North Pacific Ocean.

Timeline	Deliverables	Milestones
October 2021–May 2023	<p>Harmonization-Coordination of the research activities identified in the NPFC/PICES and NPAFC/PICES Frameworks agreed with PICES</p> <p>First draft and final version of the NPAFC/NPFC/PICES Framework for Enhanced Scientific Cooperation in the North Pacific Ocean</p>	

Implementation of conservation and management measures for stocks and species of mutual interest;

- Establish a mechanism to share the IUU vessel list of each Commission and its related information.

Timeline	Deliverables	Milestones
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August 2021–May 2022	Accessible links to the NPAFC and NPFC IUU vessel list on both Commissions’ website	NPAFC is developing the IUU vessel listing process with a study group, and the NPAFC IUU vessel list is expected to be established for the first time – May 2022
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- Expand cooperation to collect and share information relating to species of special interest for each Commission.

Timeline	Deliverables	Milestones
August 2021–December 2025	Information exchange on research cruise plans that can collect information on Pacific salmon and NPFC priority species Mutual scientific documents and publications on Pacific salmon and NPFC priority species distribution, relationships, and potential impact	Lists of scientific cruise plans are exchanged – May 2022 NPAFC/NPFC/PICES Topic Session (or Workshop) on this issue is proposed for October 2022–2023 at the PICES Annual Meeting Mutual scientific documents and publications on Pacific salmon and NPFC priority species are published in 2023–2025

- Develop, publish, and distribute public information about conservation on the high seas and consequences of IUU activity.

Timeline	Deliverables	Milestones
2021–2025	News releases and journal articles on the Commissions activities related to high seas resources conservation, MCS, and law enforcement	Secretariats annually exchange information on the relevant publications

For each agreed item a timeline, milestones, and deliverables will be mutually developed. Work plan will be discussed by the commissions and mutually agreed before June 2022.

Note: SC-related items are highlighted with grey.

Five-Year Research Plan and Work Plan of the Scientific Committee

North Pacific Fisheries Commission Scientific Committee 2021-2025 Research Plan

1.0 BACKGROUND

Article 10, Section 4(a) of the *Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean* states that the Scientific Committee (SC) will “recommend to the Commission a research plan including specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs.”

An initial draft of this research and accompanying work plan was presented for review during the 4th Preparatory Conference and a subsequent discussion was held by a small working group to establish science priorities for the NPFC. This plan draws on those discussions and was updated by the SC Chair based on the progress made by NPFC since that Conference.

The development of multi-year science research or work plans is common across regional fisheries management organizations as well as domestic fisheries science agencies. This draft plan draws on such examples, and has been developed for consideration by the SC before it may be adopted by the Commission.

2.0 OBJECTIVES

The research plan is intended to guide the work of the Scientific Committee by identifying key research priorities and associated areas of work to be undertaken or maintained. The plan should also serve to: ensure efficient utilization of scarce resources within the Commission; inform Parties’ domestic research planning as a means to complementing the Commission’s science activities; and, help the Commission identify potential sources of external funding.

It is not intended as an exhaustive plan describing all research activities that may be carried out by Parties, nor is it intended to preclude work already taking place. The plan should support the Commission’s primary objective (*Article 2* in the Convention), which is to “ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur”. The plan should also help the Scientific Committee fulfill its functions as specified in the Convention.

3.0 PRIORITY RESEARCH AREAS

In addition to discussions held during the Preparatory Conference (referenced above) followed by the Commission and Scientific Committee after their establishment, the identification of priority research areas draws largely from the Commission's Convention, which outlines specific functions for the Scientific Committee in *Article 10, Section 4*. These priority research areas are subject to the approval of the Commission, and may be revisited and/or revised as deemed appropriate by the Commission. Proposed rolling five-year work plans for each priority area are available in the attached (Annex 1).

The proposed priority research areas are:

1. Stock assessments for target fisheries and bycatch species
2. Ecosystem approach to fisheries management
3. Data collection, management and security

3.1 Stock Assessments

Rationale

Accurate stock assessments are critical in helping to ensure the long-term conservation and sustainable use of fisheries resources in the Convention Area. One of the primary functions of the Commission is setting total allowable catch or total allowable level of fishing effort, and as per *Article 7-1(b)*, this is to be in "accordance with the advice and recommendations of the Scientific Committee".

Consistent with this, *Article 10-4(b)* states that one of the functions of the Scientific Committee is to "regularly plan, conduct and review the scientific assessments of the status of fisheries resources in the Convention Area, identify actions required for their conservation and management, and provide advice and recommendations to the Commission".

Finally, *Article 10-4(i)* states that the Scientific Committee shall also "develop rules and standards, for adoption by the Commission, for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area".

The Scientific Committee should endeavor to understand the current status and trends in production of populations of priority species as agreed by the 2nd Commission meeting in 2016, as well as factors that may affect future trends.

Areas of work

- Development of baseline assessment of the status of priority stocks
- Review of existing data standards in relation to stock assessments (e.g. Annual Report template, future vessel monitoring system)
- Stock delineation of important commercial species for the purpose of providing advice for the determination of management units
- For each commercial species, determination of data requirement, including data availability and data gaps; identification, where possible, of strategies to fill the data gaps, including for bycatch
- Development of a standardized method to provide advice to the Commission
- Development of assessment models by species and research as required to determine various assessment parameters

3.1.1. Pelagic fish stock assessment

Rationale

Pelagic fish and squids are primary fisheries resources for NPFC Members. They comprised more than 99% of total catch of species covered by the Convention. Many of them are migratory species with wide geographical distributions which include both EEZs of the North Pacific Rim countries and High Seas. Management of such stocks requires close cooperation among Members concerned to ensure sustainable use and conservation of fisheries resources.

Four fish species and two squid species were recognized by the Scientific Committee as priority species: Pacific saury *Cololabis saira*, Chub mackerel *Scomber japonicus*, Spotted mackerel *Scomber australasicus*, Japanese sardine *Sardinops melanostictus*, Neon flying squid *Ommastrephes bartramii*, Japanese flying squid *Todarodes pacificus*.

Areas of work

- Completion of stock assessment for Pacific saury and development of the framework and timeline for its regular improvement and update
- Conducting stock assessment for Chub mackerel and other priority species considering their top-

down prioritization (Spotted mackerel - Japanese sardine - Neon flying squid – Japanese flying squid) and available funds and capacity

- Identification of data gaps, determination of activities to address those gaps and development of standards and mechanisms for data collection and verification
- Develop a management strategy evaluation (MSE) for Pacific saury in collaboration with NPFC’s Technical and Compliance Committee (TCC), NPFC’s Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS), fishery managers, fishers, stakeholders, and observers.

3.1.2. Bottom fish stock assessment

Rationale

Data used for traditional stock assessment are sparse for bottom fish, and it is unlikely that traditional methods will be applicable for most deepwater species in the Convention Area. In addition, some bottom species have unique life cycles, sporadic recruitment patterns and irregular spawning-recruitment relationships that also makes difficult accurate stock assessment. All these require specific approaches for management and sustainable use of bottom fisheries resources. More than ten bottom species have been exploited by fisheries in the Convention Area during the last two decades. Two fish are recognized as priority species: North Pacific armorhead (NPA) *Pentaceros wheeleri* and splendid alfonsino *Beryx splendens*.

Areas of work

- Review of approaches applicable for stock assessment of target bottom species and investigate various management strategies
- Further development of the Adaptive Management approach for NPA and mechanism for its implementation
- Identification of data needs and establishment of activities to fill data gaps

3.2 Ecosystem Approach to Fisheries Management

Rationale

Article 3 (c) in the Convention states that: “In giving effect to the objective of this Convention, the following actions shall be taken individually or collectively as appropriate: (c) adopting and

implementing measures in accordance with the precautionary approach and an ecosystem approach to fisheries, and in accordance with the relevant rules of international law, in particular as reflected in the 1982 Convention, the 1995 Agreement and other relevant international instruments”.

Article 7-1 (c,d) in the Convention states that the Commission shall: “adopt, where necessary, conservation and management measures for species belonging to the same ecosystem or dependent upon or associated with the target stocks”; and, “adopt, where necessary, management strategies for any fisheries resources and for species belonging to the same ecosystem or dependent upon or associated with the target stocks, as may be necessary to achieve the objective of this Convention.”

Article 10-4 (d) states that the Scientific Committee shall “assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks.”

Areas of work

- Formulation of a work plan on how to implement the ecosystem approach to fisheries management in the Convention Area
- Vulnerable Marine Ecosystems
- Understand ecological interactions among species
- Ecosystem modelling
- Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species
- Other issues related to marine ecosystems including marine debris and pollution

3.2.1 Vulnerable Marine Ecosystems

Rationale

The identification of vulnerable marine ecosystems is a necessary precursor to implementing measures to protect these ecosystems, and such measures are explicitly called for in the Convention (e.g. *Article 7-1(e)*).

Article 10-4 (e) states that the Scientific Committee shall “develop a process to identify vulnerable marine ecosystems, including relevant criteria for doing so, and identify, based on the best scientific information available, areas or features where these ecosystems are known to occur, or are likely to occur, and the location of bottom fisheries in relation to these areas or features, taking due account

of the need to protect confidential information.”

Article 7-1 (e) states that the Commission shall “adopt conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems in the Convention Area, including but not limited to: measures for conducting and reviewing impact assessments to determine if fishing activities would produce such impacts on such ecosystems in a given area; measures to address unexpected encounters with vulnerable marine ecosystems in the course of normal bottom fishing activities; and as appropriate, measures that specify locations in which fishing activities shall not occur.”

To date, Japan, Russia, Korea, the US and Canada have completed a report on identification of VMEs and an assessment of impacts caused by bottom fishing activities on VMEs and marine species. The Scientific Committee may build on these reports, which will be kept up to date by respective Parties.

Areas of work

- Review existing NPFC standards on VME data collection, including guidelines set forth in the CMMs for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean (CMM 2021-05 and CMM 2019-06), and determine if any modifications to these standards are needed in the short-term and/or longer term
- Review of Encounter Protocol for bottom fisheries on Vulnerable Marine Ecosystems
- Determination of data requirements and identification of what data may be collected through commercial fishing operations
- Develop consensus on criteria used to identify VMEs and how this might be applied in the NPFC (note that guidelines from the FAO are already referenced in Annex 2 of the CMM 2021-05 and CMM 2019-06)
- Analysis of known or suspected VMEs in the Convention Area
- Visual surveys of VMEs for data collection
- Development of a framework to conduct assessments of Impacts of Bottom Fishing Activities on Vulnerable Marine Ecosystems

3.2.1.1 Review of Encounter Protocol for bottom fisheries on Vulnerable Marine Ecosystems

Rationale

The purposes of VME encounter protocols in NPFC Convention Area include:

- Ensuring early detection and protection of potential VMEs within an existing fishing area;
- Ensuring early detection and protection of potential VME within an unfished area;
- Documenting information on known occurrences of VME indicators within the Convention Area.

Development of the Encounter Protocol progressed through Scientific Committee meetings as well as intersessional activities. VME encounter protocols are incorporated in the CMMs for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean, specifically in Para 4(g) and 3(j), respectively.

Areas of Work

Consideration of the following subjects of research and analyses are recommended to further refine encounter protocols in the Convention Area (as notified in Appendix C, NPFC01-2016-SSCVME01- Final Report):

- Other taxa, topographical, geographical and geological features that may indicate the presence of VMEs;
- Taxon-specific encounter thresholds and reporting;
- Framework for evaluating the effectiveness of encounter protocols;
- Tiered approach with different encounter protocols associated with different thresholds;
- Gear-specific thresholds to reflect differences in catchability;
- Gear-specific move-on distances to reflect type of gear;
- Different reporting requirements for different catches;
- Tiered approach to reporting bycatch of VME indicator taxa;
- Different encounter protocols for existing and new fishing areas

3.3 Data collection, management and security

Rationale

Article 10, paragraph 4 (i) in the Convention states that the functions of the Scientific Committee shall be to: “develop rules and standards, for adoption by the Commission, for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area”.

Areas of work

- Review of data standards related to stock assessments and other relevant data, including VME data collection and vessel monitoring systems
- Identify data sources to meet data needs for priority areas of work above and develop programs for data collection
- Develop data security policy including data handling and sharing protocol, information confidentiality classification and access control security guideline

4.0 IMPLEMENTATION AND REVIEW

The SC will review the Research Plan and update it as necessary on an annual basis. The Research Plan will form the foundation of SC's rolling five-year Work Plan. Monitoring the implementation of this Research Plan will be the responsibility of the Chair of the Scientific Committee in collaboration with the Chairs of the Scientific Committees' subsidiary groups and the Executive Secretary. Members of the Commission and the Secretariat will share responsibility for implementation of the Research Plan.

Full implementation of the Research Plan will likely be beyond the means of the Commission's core budget. Extra-budgetary funds from voluntary contributions of Members and other sources will be required and actively sought by the Commission. Nevertheless, adoption of the Plan by the Scientific Committee and subsequent strong support from the Commission is a prerequisite to securing the necessary extra-budgetary funds.

An independent external review of the Plan may periodically be requested by the SC. The Scientific Committee will be responsible for preparing the terms of reference for the review. The Scientific Committee will present the report of the review to the next regular session of the Commission.

5.0 SCIENTIFIC COLLABORATION WITH OTHER ORGANIZATIONS

While not included as a priority, *Article 21* of the Convention addresses cooperation with other organizations or arrangements. It calls on the Commission to cooperate, as appropriate, on matters of mutual interest with Food and Agriculture Organization (FAO), other specialized agencies of the FAO and relevant Regional Fisheries Management Organizations (RFMOs). Further, the Commission is called on to develop cooperative working relationships, including potential agreements, with intergovernmental organizations that can contribute to its work.

Article 10 also speaks to this issue in clauses five and six, stating that the Scientific Committee may

exchange information on matters of mutual interest with other relevant scientific organizations or arrangements, and that the Committee shall not duplicate the activities of other scientific organizations and arrangements that cover the Convention Area.

The impetus to collaborate is made stronger by the prospect of limited research funding in the Commission, at least in the short-term, but it is also in the best interests of the Commission to seek synergies with other organizations with mutual interests and similar membership (e.g. North Pacific Marine Science Organization (PICES) and North Pacific Anadromous Fish Commission (NPAFC)).

Activities could include:

- Evaluate reports of International Organizations that may be relevant to the functioning of the Scientific Committee
- Identify other organizations with relevant mandates and activities
- Formalize relationships with these organizations (e.g. MOUs, standing invitations to meetings)
- Identify potential funding opportunities

Five-Year Work Plan of the Scientific Committee and its subsidiary bodies

Small Scientific Committee on Pacific Saury (SSC PS)

Priority list:

1. Conduct a stock assessment update based on BSSPM analyses
2. Further investigate improvements to the BSSPM
3. Develop an age/size-structured model
4. Develop a list of plausible ranges for biological parameters
5. Develop databases to support age/size-structured models
6. Continue joint CPUE work to incorporate broader spatial and temporal coverage
7. Update the biomass estimate using the existing method (swept area method)
8. Develop spatio-temporal model for the biomass estimate
9. Further refine the catchability coefficient of the Japanese survey and characterize its variance
10. Develop a longer-term roadmap for work related to Pacific saury stock assessment
11. Set biological reference points
12. Develop a timeframe for MSE process

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[H] and [M] indicate high and medium priorities. Cells with “TBD” depend on the progress of data preparation and analytical works.

ITEM	2021	2022	2023	2024	2025
Regular update of inputs					
Update & improvement of biomass survey index	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues
Update & improvement of CPUE indices	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]
Development of joint CPUE index	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]	Continue review of outcomes of regular update and analytical works [H]
Regular update of the existing SA					
Routine update BSSPM as a benchmark	Continue review of outcomes of regular BSSPM update [M]	Continue review of outcomes of regular BSSPM update [M]	TBD ¹⁾	TBD ¹⁾	TBD ¹⁾
Improvement and further investigation of BSSPM	Review any outcomes of improvements (see Para 29 in TWG PSSA04 report) [M]	Review any outcomes of improvements, inter alia in light of possible incorporation of environmental information [H]	TBD ¹⁾	TBD ¹⁾	TBD ¹⁾
Toward age/size-structured models (ASSMs)					
Data	Finalize data for 2021 stock	Continue update of data for	TBD ²⁾	TBD ²⁾	TBD ²⁾

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ITEM	2021	2022	2023	2024	2025
inventory (CPUE and size/age in space and time)	assessment with ASSMs [H]	stock assessment with ASSMs [H]			
Summarizing available information on PS biology	Finalize assumption for 2021 stock assessment with ASSMs [H]	Continue update of data for stock assessment with ASSMs [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾
Development of models	Review results of analyses by an agreed initial set of ASSMs [H]	Finalize models and results of analyses by ASSMs [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾
Uncertainty in models (possible link with OM grid under MSE)	Start investigation [M]	Finalize the procedure of assessing model uncertainty [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾
Examination of estimation performance and finalization of models	Review initial simulation works [H]	Finalize simulation works [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾
Toward development of reference points					
Set biological reference points (limit and target)	Continue discussion and adoption [H]	Continue discussion and amend if necessary [H]	TBD	TBD	
Toward development of MSE					

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ITEM	2021	2022	2023	2024	2025
(work formally starts in 2022)³⁾					
Development of management objectives					
Definition of performance measures					
Construction of OMs					
Development of candidate MPs					
Simulation performance tests					
Comparison of MPs and finalize advice					

¹⁾ It depends on the progress of the age/size-structured models and discussion about how the BSSPM will be used for future assessment and management. As a backup method as well as an underlying assessment method used in a management procedure, it seems sensible to keep this as one of reference assessment models.

²⁾ These items might be re-structured depending on the progress of preparation of data and biological information as well as the development of models.

³⁾ More specific plans and timeline will be developed after the first WG MSE PS starts.

Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

Priority list:

1. Data preparation and review of biological information
2. Develop an operating model
3. Test stock assessment models (VPA, ASAP, KAFKA, SAM, state-space production model)
4. Conduct stock assessment of chub mackerel
5. Set biological reference points
6. Provide scientific advice on the management of chub mackerel stock to the Commission
7. Regularly update and refine inputs
8. Conduct MSE for chub mackerel

ITEM	2021 summer	2022 spring	2022	2023	2024	2025
Regular update of inputs						
Research survey indices	<ul style="list-style-type: none"> • Standardize survey data (intersessional) • Review the data used for the stock assessment 	Review the data used for the stock assessment	Finalize the data used for the stock assessment	Update	Update	Update
CPUE indices	<ul style="list-style-type: none"> • Standardize CPUE (intersessional) • Review the data used for the stock assessment 	Review standardized CPUE indices for stock assessment	Finalized CPUE standardization	Update	Update	Update
Catch data/catch composition	Review the data used for the stock assessment	Review the data used for the stock assessment	Finalize the data used for the stock assessment	Update	Update	Update
Biological parameters (maturity,	Review biological parameters	<ul style="list-style-type: none"> • Review biological parameters 	Finalize assumptions for the stock	Review biological parameters	Review biological parameters	Review biological parameters

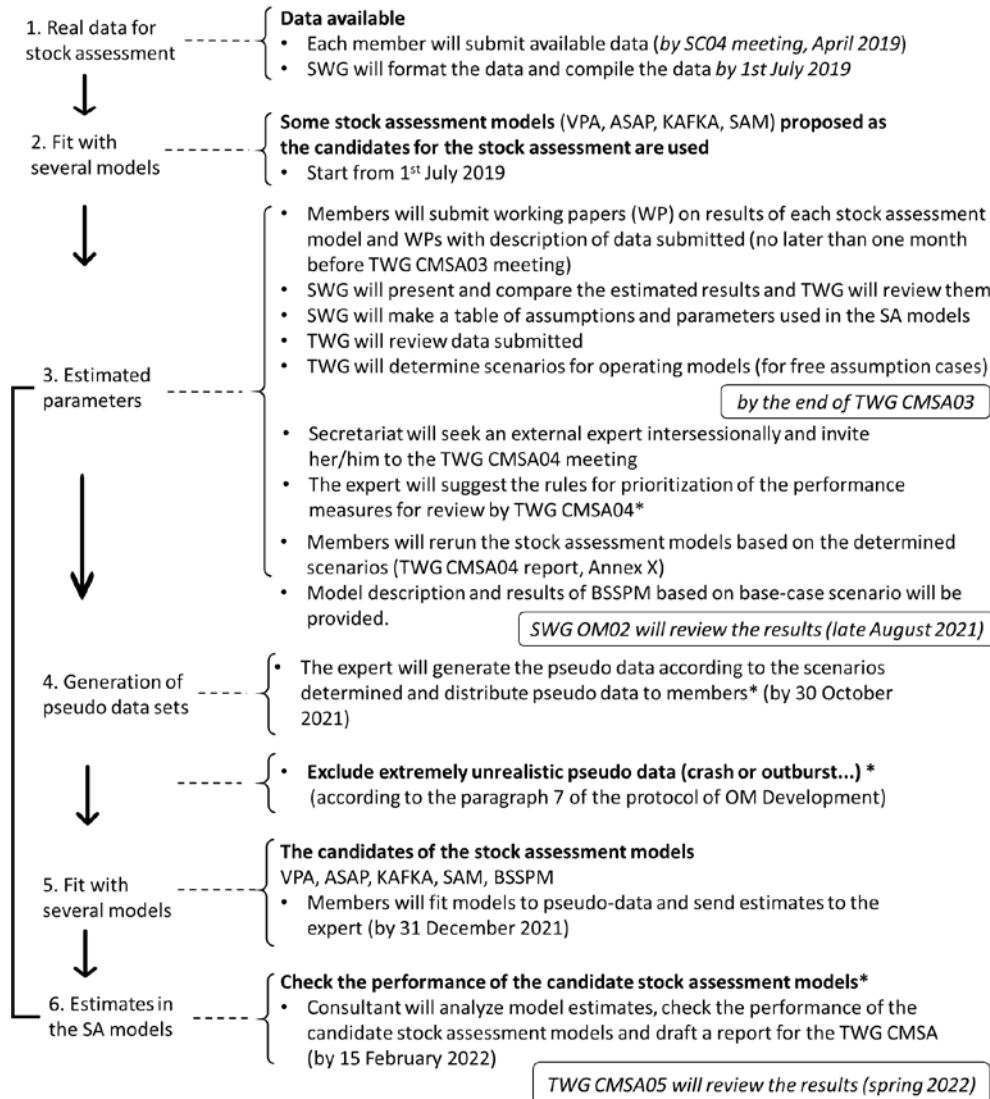
ITEM	2021 summer	2022 spring	2022	2023	2024	2025
M, weight)		<ul style="list-style-type: none"> Determine the range of assumption for preliminary stock assessment 	assessment			
Operating model (OM)						
Development of operating model	<ul style="list-style-type: none"> Agree on the rules for prioritization of the performance measures Generate pseudo data to be fitted to the stock assessment models (intersessional) 					
Testing stock assessment models	Members fit models to pseudo-data and send estimates to the Secretariat (intersessional)	<ul style="list-style-type: none"> Consultant drafts a report about the performance of the candidate stock assessment models (intersessional) Choose the best SA model(s) 				
Stock assessment						
Benchmark stock assessment		Discuss future projection methods	<ul style="list-style-type: none"> Determine the method for future projection Conduct preliminary stock assessment 	Complete stock assessment with the selected SA model(s)	Update SA model	Update SA model
Improvement and further investigation of the selected model					Review and improve, if needed, the SA model	Review and improve, if needed, the SA model

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ITEM	2021 summer	2022 spring	2022	2023	2024	2025
Toward development of reference points						
Set biological reference points (limit and target)		<ul style="list-style-type: none"> • Review RPs report • List candidate reference points 	<ul style="list-style-type: none"> • Compare robustness of reference points • Choose reference points 		Review reference points	
Toward development of MSE*						
Development of management objectives		Liaise with the Commission and TCC to set management objectives	Finalize management objectives			
Definition of performance measures		List of performance measures	Review performance measures	Select performance measure		Review performance measures
Construction of OMs	Continue	Discuss MSE approaches and frameworks for chub mackerel	Discuss ranges of uncertainties			
Development of candidate MPs		Suggest preliminary list of MPs	Review the list of MPs			Review the performance of MP
Simulation performance tests			Conduct preliminary MSE	Conduct MSE		
Comparison of MPs and finalize advice				Select MP and suggest HCR to SC	Review MP and HCR	Continue

* Work plan for the development of MSE will be reviewed and revised by the TWG CMSA in the future.

Flowchart for the development of operating models and testing stock assessment models



* By an external expert

Small Scientific Committee on Bottom Fish and Marine Ecosystems (SSC BF-ME)

Priority list:

1. NPA and SA: Develop catch and CPUE time series for commercial fisheries
2. NPA: Review survey
3. NPA: Conduct comprehensive stock assessment and provide management advice
4. SA: Conduct comprehensive stock assessment and provide management advice
5. NPA, SA and Sablefish: Develop and implement harvest control rule
6. Sablefish: Evaluate historical harvest relative to trip limits and update trip limits if necessary
7. Sablefish and VME: Conduct trade-off analysis between commercial fishing and VME protection
8. VME: Collect and share fishing footprint data
9. VME: Develop a process for establishing quantitative definitions of VMEs
10. VME: Develop standardized approach to SAI determination

ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
North Pacific Armorhead					
Assess and monitor status of stock	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA
	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys

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ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
	Integrate CPUE index and NPA surveys (acoustic and pre-fishery) into preliminary stock assessment or simulation approach using DLM tools	Life history based DLM approach	Update status of stock	Update status of stock	Update status of stock
	Review acoustic survey and research	Review acoustic survey and research			
	Conduct analysis of historical patterns in NPA recruitment and oceanography; Identify and conduct additional research on NPA	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice

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ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
Conserve stock	Develop conservation objective(s)		Develop conservation objective(s)		
			Implement adaptive management		
		Refine harvest control rule if needed	Refine HCR and implement	Update data and implement HCR	Update data and implement HCR
Splendid alfonso					
Assess and monitor status of stock	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA
	Develop monitoring plan for SA				
	Conduct comprehensive stock assessment or data limited approach	DLM approach life history	Update comprehensive stock assessment or data limited approach, and provide management advice	Update comprehensive stock assessment or data limited approach, and provide management advice	Update comprehensive stock assessment or data limited approach, and provide management advice

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ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice
Conserve stock			Develop conservation objective(s); Define and implement harvest control rule	Update data and implement HCR	Update data and implement HCR
Sablefish					
Assess and monitor status of stock	Update catch data and CPUE index	Update catch data and CPUE index	Update catch data and CPUE index	Update catch data and CPUE index	Update catch data and CPUE index
	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish

Annex H:SC06 Report

ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice
Conserve stock	Evaluate catch limits relative to stock status	Update catch limits relative to stock status			
	Summarize harvest control rules and stock status				
Other research		Conduct analysis of sablefish associations with VME (intersessional)			
		Conduct trade-off analysis for Sablefish fishing and VME protection (intersessional)			
Vulnerable marine ecosystems					

Annex H:SC06 Report

ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
Defining and Identifying VMEs	Map the distribution of VME indicator taxa (model, kernel density estimates, observation data);	Bring together VME indicator taxa observation data from various sources and map for NPFC area			
	Determine a quantitative definition of VMEs	Determine a quantitative definition of VMEs	Review and apply quantitative definition of VMEs		
Identifying and defining SAI's	Determine data requirements and resolution for SAI assessment	Determine data requirements and resolution for SAI assessment	Conduct integrated SAI assessment	Conduct integrated SAI assessment	Conduct integrated SAI assessment
	Apply the standardized approach for SAI assessments and conduct integrated SAI assessment	Apply the standardized approach for SAI assessments and conduct integrated SAI assessment			
		Discuss VME indicator taxa and whether species/taxa should be added/subtracted			

Annex H:SC06 Report

ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
Quantifying interactions between fisheries and VMEs	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data
	Implement timely reporting and action protocol when VME sites or recovering sites are identified				
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice
Conserving VMEs		Develop management objectives for recovering VME sites	Develop management objectives for recovering VME sites	Periodic review of VME management	Periodic review of VME management
	Refine the exploratory fishing protocol and consider banning exploratory fishing in VME closed areas				

Annex H:SC06 Report

ITEM	SSC BFME02 (2021)	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)
	Review and refine the encounter protocol if necessary				
		Literature review on impacts and impact rates by fishing gears			
Other ecosystem components					
	Approval of fish ID guide for scientific observers in the NW Pacific Ocean	Publication of fish ID guide for scientific observers in the NW Pacific Ocean			

Scientific Committee (SC)

Priority list

As stipulated in the Convention, Article 10, the Scientific Committee shall provide scientific advice and recommendations to the Commission which is considered the highest priority task of the SC. The following priority areas have been identified for SC:

1. Priority species summaries and stock assessments for management advice
2. Management Strategy Evaluation (MSE) for priority species
3. Ecosystem approach to fisheries management: understand ecological interactions among species and impacts of fishing on fisheries resources and their ecosystem components
4. Collaboration with other organizations
5. Regular review of the research plan and work plan
6. Data collection, management, and security

ITEM	2021	2022	2023	2024	2025
Priority Species					
Summaries of priority species	Develop summary template	Draft summary sheet	Update summary sheets as needed	Update summary sheets as needed	Update summary sheets as needed
Assessment of Blue (Spotted) Mackerel and associated bycatch	Identify lead Identify data sources, data gaps and strategies to fill gaps	Collate data Develop data collection templates and share data Determine spatial structure of stocks	Undertake baseline stock assessment and provide management advice including harvest control rules	Update baseline stock assessment as needed and provide management advice including harvest control rules	Update baseline stock assessment as needed and provide management advice including harvest control rules

ITEM	2021	2022	2023	2024	2025
				Collate data on associated bycatch species	Develop baseline stock assessment of associated bycatch species
Assessment of Japanese Sardine and associated bycatch	Identify lead Identify data sources, data gaps and strategies to fill gaps	Collate data Develop data collection templates and share data Determine spatial structure of stocks	Undertake baseline stock assessment and provide management advice including harvest control rules	Update baseline stock assessment as needed and provide management advice including harvest control rules Collate data on associated bycatch species	Update baseline stock assessment as needed and provide management advice including harvest control rules Develop baseline stock assessment of associated bycatch species
Assessment of Neon Flying Squid and associated bycatch	Identify lead Identify data sources, data gaps and strategies to fill gaps	Collate data Develop data collection templates Determine spatial structure of stocks	Undertake baseline stock assessment and provide management advice including harvest control rules	Update baseline stock assessment as needed and provide management advice including harvest control rules Collate data on associated bycatch species	Update baseline stock assessment as needed and provide management advice including harvest control rules Develop baseline stock assessment of associated bycatch species
Assessment of Japanese Flying Squid and associated bycatch	Identify lead Identify data sources,	Collate data	Undertake baseline stock assessment and provide management advice	Update baseline stock assessment as needed and provide management	Update baseline stock assessment as needed and provide management

ITEM	2021	2022	2023	2024	2025
	data gaps and strategies to fill gaps	Develop data collection templates Determine spatial structure of stocks	including harvest control rules	advice including harvest control rules Collate data on associated bycatch species	advice including harvest control rules Develop baseline stock assessment of associated bycatch species
Management Strategy Evaluation (MSE)					
Pacific Saury	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals
Ecosystem approach to fisheries management					
Ecological Interactions	Understand ecological interactions among species in the North Pacific Ocean	Understand ecological interactions among species in the North Pacific Ocean	Understand ecological interactions among species in the North Pacific Ocean	Understand ecological interactions among species in the North Pacific Ocean	Understand ecological interactions among species in the North Pacific Ocean
Impacts of fishing on ecosystem component	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards

ITEM	2021	2022	2023	2024	2025
Collaboration with other Organizations					
PICES	<p>Review implementation of NPFC-PICES Framework for Collaboration</p> <p>Review ICES-PICES WGSPF activities</p> <p>Review PICES WG37 activities</p>	<p>Review implementation of NPFC-PICES Framework for Collaboration</p> <p>Review ICES-PICES WGSPF activities</p> <p>Review PICES WG37 activities</p> <p>Review NPFC-PICES workshop on VME indicator identification</p>	<p>Review implementation of NPFC-PICES Framework for Collaboration</p> <p>Identify other opportunities for collaboration with PICES.</p> <p>Review PICES WG37 activities</p>	<p>Review implementation of NPFC-PICES Framework for Collaboration</p> <p>Identify other opportunities for collaboration with PICES</p>	<p>Review implementation of NPFC-PICES Framework for Collaboration</p> <p>Identify other opportunities for collaboration with PICES</p>
FAO	Review partnership with FIRMS	Review NPFC's involvement in the 2nd Phase of the GEF-FAO Common Oceans Programme			
NPAFC	Discuss, review and	Review work plan to	Undertake scientific	Undertake scientific	Undertake scientific

ITEM	2021	2022	2023	2024	2025
	revise the work plan to implement the NPFC/NPAFC Memorandum of Cooperation Review NPAFC- NPFC multinational survey program	implement NPFC/NPAFC Memorandum of Cooperation Review NPAFC- NPFC multinational survey program	activities to achieve relevant deliverables of the work plan	activities to achieve relevant deliverables of the work plan	activities to achieve relevant deliverables of the work plan
Other organizations	Review collaborations with other organizations	Review collaborations with other organizations	Review collaborations with other organizations	Review collaborations with other organizations	Review collaborations with other organizations
Research and Work Plans					
Terms of Reference	Review SC's Terms of Reference	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed
Research Plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan
Work Plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan
Projects	Review completed and ongoing projects Identify and prioritize	Review completed and ongoing projects Identify and prioritize	Review completed and ongoing projects Identify and prioritize	Review completed and ongoing projects Identify and prioritize	Review completed and ongoing projects Identify and prioritize

ITEM	2021	2022	2023	2024	2025
	new projects and recommend sources of funding	new projects and recommend sources of funding	new projects and recommend sources of funding	new projects and recommend sources of funding	new projects and recommend sources of funding
Data Management					
	Discuss need of VMS data for scientific analyses Review data management system (DMS) and Electronic Annual Report	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy
Recommendations					
Advice	Develop recommendations for the Commission, TCC, and FAC	Develop recommendations for the Commission, TCC, and FAC	Develop recommendations for the Commission, TCC, and FAC	Develop recommendations for the Commission, TCC, and FAC	Develop recommendations for the Commission, TCC, and FAC
Media Communication					
Press Release	Prepare and publish a press release about SC activities during its	Prepare and publish a press release about SC activities during its	Prepare and publish a press release about SC activities during its	Prepare and publish a press release about SC activities during its	Prepare and publish a press release about SC activities during its

Annex H:SC06 Report

ITEM	2021	2022	2023	2024	2025
	meeting	meeting	meeting	meeting	meeting



North Pacific Fisheries Commission

Annex I: SC07 Report

NPFC-2022-SC07-Final Report

7th Scientific Committee Meeting REPORT

16-20 December 2022

February 2023

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**North Pacific Fisheries Commission
7th Meeting of the Scientific Committee**

16-20 December 2022

WebEx

REPORT

Agenda Item 1. Opening of the Meeting

1. The 7th Meeting of the Scientific Committee (SC) took place as a virtual meeting via WebEx, and was attended by Members from Canada, China, the European Union (EU), Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America and Vanuatu. Panama attended as a Cooperating non-Contracting Party. The Deep Sea Conservation Coalition (DSCC), the United Nations Food and Agriculture Organization (FAO), the North Pacific Anadromous Fish Commission (NPAFC), the North Pacific Marine Science Organization (PICES), the Pew Charitable Trusts (Pew), and the Southern Indian Ocean Fisheries Agreement (SIOFA) attended as observers. Dr. Penelope Ridings attended as a Secretariat Guest in her role as the Chair of the NPFC Performance Review Panel. The meeting was opened by Dr. Janelle Curtis (Canada), who served as the SC Chair.
2. The Executive Secretary, Dr. Robert Day, welcomed the participants to the meeting. He expressed appreciation for the contributions of Members and observers to the work of the NPFC, and commended the SC and its subsidiary bodies for the dedicated efforts they have made to advance the scientific work of the NPFC, despite the challenging conditions posed by the pandemic. The Executive Secretary also emphasized the value of the NPFC's cooperation with other organizations. In closing, he encouraged the SC and its subsidiary bodies to continue to work collaboratively and cooperatively to produce the best scientific information possible.
3. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

4. The SC agreed to hear an update from the EU on its chub mackerel fisheries operation plan and impact assessment under Agenda Item 12.3 Other issues.
5. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Meeting arrangements

6. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

Agenda Item 4. NPFC Performance Review recommendations for the Scientific Committee

7. The Chair of the NPFC Performance Review Panel, Dr. Penelope Ridings, summarized the outcomes and recommendations of the Performance Review applicable to the SC. The Performance Review found that the SC has initiated a comprehensive and ambitious program of scientific research, that the scientific research draws not only on Members' scientific experts but also on independent experts, that the SC is working on the development of management strategy evaluations (MSEs) leading to harvest control rules (HCRs) and has initiated a science-management dialog to that end, and that the SC has done valuable work-planning in relation to the NPFC's large number of priority stocks. The Performance Review has also identified, as the main issues, the poor or unknown status of some stocks, issues with data collection and data gaps, and the unknown extent of bycatch. Of the Performance Review Recommendations, 25 are of relevance to the SC.
8. The SC noted that the Performance Review report will be formally reviewed and endorsed by the Commission at its next meeting in March 2023. The SC tasked its subsidiary bodies, including the four informal small working groups, pending the approval of the report by the Commission, to review relevant recommendations from the Performance Review report at their intersessional meetings or through email correspondence in 2023, evaluate their ability and necessary timelines to achieve the objectives in those recommendations, and to report on the outcomes of their reviews at the SC08 meeting.

Agenda Item 5. Review of reports and recommendations from the Small Scientific Committees (SSC BF-ME and SSC PS) and the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

5.1 Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

9. The TWG CMSA Vice Chair, Dr. Kazuhiro Oshima (Japan), summarized the outcomes and recommendations of the 5th and 6th TWG CMSA meetings (NPFC-2022-TWG CMSA05-Final Report, NPFC-2022-TWG CMSA06-Final Report).
10. The SC reviewed the recommendations of the TWG CMSA and endorsed the following recommendations:
 - (a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2022-TWG CMSA05-WP02 (Rev. 1)).
 - (b) The TWG CMSA recommended that the SC select Dr. Kazuhiro Oshima (Japan) to serve

as the TWG CMSA Chair.

- (c) The TWG CMSA recommended that the SC select Dr. Qiuyun Ma (China) to serve as the TWG CMSA Vice Chair.
- (d) The TWG CMSA recommended extending the consultancy agreement with the external expert to support the TWG CMSA in selecting a model for stock assessment of chub mackerel in 2023.

- 11. The SC considered the request from the TWG CMSA to provide clarification on whether national waters fall under the scope of the task assigned by the SC to its subsidiary bodies of reporting the data needs and outlining methods that could be used to collect the necessary data. The SC agreed that national waters do fall under the scope of this task as the data from national waters are important for understanding the life history of the NPFC priority species, especially migratory species, and species belonging to the same ecosystem or dependent upon or associated with target stocks.
- 12. The SC endorsed the reports provided by the TWG CMSA.
- 13. The SC noted that the TWG CMSA intends to select a stock assessment model(s) for chub mackerel at its next meeting in 2023.
- 14. The SC tasked the TWG CMSA with preparing a species summary document for chub mackerel.

5.2 SSC on Bottom Fish and Marine Ecosystems

- 15. The Chair of the SSC on Bottom Fish and Marine Ecosystems (SSC BF-ME), Dr. Chris Rooper (Canada), summarized the outcomes and recommendations of the 3rd SSC BF-ME meeting (NPFC-2022-SSC BFME03-Final Report).
- 16. The SC reviewed the recommendations of the SSC BF-ME and endorsed the following recommendations:
 - (a) Adopt the updated species summaries of North Pacific armorhead (Annex D), splendid alfonsino (Annex E), sablefish (Annex F), and blackspotted and roughey rockfishes (Annex G), and inform the Commission about the trends in catch and effort and other scientific information relevant to management of NPA and SA.
 - (b) Endorse the field guide for identification of fishes of the Emperor Seamount Chain captured by bottom fisheries (NPFC-2022-SSC BFME03-WP08).
 - (c) Endorse the use of the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to the oreosomatid fish in the Emperor Seamounts area.

- (d) Establish a formal procedure for changing species' scientific and common names used by the NPFC.
- (e) Endorse the process proposed by Canada in NPFC-2022-SSC BFME03-WP03 as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area, and Canada's application of this method in the eastern part of the Convention Area.
- (f) Establish a project for understanding the basis by which other RFMOs' encounter thresholds were determined by taxa and gear-type.
- (g) Recommend to the Commission that a move-on rule of 1 nautical mile be set for all bottom fishing gear.
- (h) Endorse the Hexactinellida and Demospongiae sponge classes as VME indicator taxa.
- (i) Adopt the [terms of reference for sharing VME data](#).
- (j) Adopt the [template for sharing VME data](#).
- (k) Endorse the updated 2022-2026 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2022-SSC BFME03-WP01 (Rev. 1)).
- (l) Endorse the revised CMM 2021-05 (Annex L).
- (m) Endorse the revised CMM 2019-06 (Annex M).
- (n) Recommend that the Commission consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A in addition to the revisions recommended in paragraph 16(l).
- (o) Recommend that the Commission co-sponsor the PICES 2023 session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" by contributing the equivalent of \$5,000 USD.

17. The SC agreed to discuss the establishment of a formal procedure for changing species' scientific and common names used by the NPFC, including how to handle the issue of a species not having a 3-letter ASFIS code in FAO, as is the case with *Allocyttus folletti*, at SC08.

18. The SC endorsed the report provided by the SSC BF-ME.

5.3 SSC on Pacific Saury

19. The Chair of the SSC on Pacific Saury (SSC PS), Dr. Toshihide Kitakado (Japan), summarized the outcomes and recommendations of the 9th and 10th SSC PS meetings (NPFC-2022-SSC PS09-Final Report, NPFC-2021-SSC PS10-Final Report).

20. The SC reviewed the recommendations of the SSC PS and endorsed the following recommendations:

- (a) Endorse the revised [Terms of Reference of the SSC PS](#).
- (b) Endorse the stock assessment report (Annex N).

- (c) Endorse the SSC PS Work Plan (NPFC-2022-SSC PS10-WP01 (Rev. 1)).
- (d) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
- (e) Consider and endorse the following rationale and approach in its scientific advice to the Commission:
 - i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) based on historical catch is much larger than a TAC that would be based on the F_{MSY} catch approach ($B_{2022} * F_{MSY} = 205,000$ tons). The current biomass is much lower than B_{MSY} and the TAC for 2021-2022 did not reduce fishing mortality in recent years. A harvest control rule (HCR) that reduces F when biomass is low may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 403,000 tons). A reduction to the TAC for 2021-2022 would increase the probability of higher biomass and catch levels in the Pacific saury stock.
 - ii. An HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world. For example, if an HCR that reduces F linearly when biomass is below B_{MSY} is applied, the TAC calculated based on such an HCR ($B_{2022} * F_{MSY} * (B_{2022} / B_{MSY}) = 101,000$ tons) could be similar with the current catch (98,000 tons, preliminary as of mid-December 2022).
 - iii. Note, however, the performance of the above HCRs has not been evaluated by a formal MSE framework for Pacific saury. They were used as simple illustrations of common approaches used elsewhere.

21. The SC endorsed the reports provided by the SSC PS.

22. The SC Chair expressed her intention to work with the Secretariat and the SSC PS to develop a summary of species information about Pacific saury that is similar in format to the species summary documents prepared for other priority species.

5.3.1 Selection of vice-chair of SSC PS

23. No nominations were received for the position of vice-chair of the SSC PS.

Agenda Item 6. Report and recommendations from the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

24. The co-Chair of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS), Dr. Toshihide Kitakado (Japan), informed participants about progress of the SWG MSE PS including the outcomes and recommendations of its 1st and 2nd meetings (NPFC-2022-SWG MSE PS01-Final Report, NPFC-2022-SWG

MSE PS02-Final Report).

Agenda Item 7. Priority species

7.1 Summary of progress on the remaining four priority species

25. The Leads of the Small Working Groups (SWGs) on neon flying squid (NFS), Japanese flying squid (JFS), Japanese sardine (JS), and blue mackerel (BM) reported on the SWGs' intersessional activities, including the relevant outcomes of the 1st and 2nd joint meetings of these SWGs, in the respective sections below (7.1.1 – 7.1.4). Detailed summaries of the joint SWG meetings are available in NPFC-2022-SC07-WP05 (1st meeting) and NPFC-2022-SC07-WP06 (2nd meeting).

7.1.1 Neon flying squid

26. The SWG NFS Lead, Dr. Luoliang Xu (China), reported on the SWG NFS' intersessional activities. The SWG NFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), developed a data template and shared catch and effort data in accordance with the template, evaluated the population dynamics and environmental impacts on NFS and developed a template for sharing relevant information/literature on the subject, reviewed previous stock assessment methods used on NFS (swept area, depletion model, surplus-production models) or other similar species (SAM model for JFS), discussed potential strategies for effective management, and updated the species summary document for NFS.

27. The SWG NFS Lead presented the updated species summary document for NFS (NPFC-2022-SC07-WP07).

28. The SC reviewed and endorsed the species summary document for NFS (Annex H).

29. The SC discussed future tasks for the SWG NFS and agreed on the following:

- (a) Update the species summary
- (b) Discuss potential data sharing needs
- (c) Share data for NFS, including unpublished data if possible
- (d) Update catch and effort data
- (e) Calculate nominal CPUE
- (f) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
- (g) Share literature relevant to understanding the fishery population dynamics of NFS, including unpublished literature if possible
- (h) Discuss the possibility of linking footprint and effort data on NFS using GIS tools
- (i) Explore the application of existing stock assessment models or develop a new stock

assessment model for NFS

- (j) Share JFS stock assessment code for developing a stock assessment model for NFS
- (k) Conduct other research that may contribute to the provision of management advice

7.1.2 Japanese sardine

- 30. The SWG JS Lead, Dr. Chris Rooper (Canada), reported on the intersessional activities of the SWG JS. The SWG JS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), evaluated the spatial structure for Japanese sardine, developed a data sharing template and shared catch and effort data in accordance with the template, evaluated the population dynamics and environmental impacts on JS and developed a template for sharing relevant information/literature on the subject, reviewed the methods and results of Japan's domestic stock assessment of JS conducted since 1976, and updated the species summary document for JS.
- 31. The SWG JS Lead presented the updated species summary document for JS (NPFC-2022-SC07-WP08).
- 32. The SC reviewed and endorsed the species summary document for JS (Annex I).
- 33. The SC discussed future tasks for the SWG JS and agreed on the following:
 - (a) Update the species summary
 - (b) Discuss potential data sharing needs
 - (c) Share data for JS, including unpublished data if possible
 - (d) Update catch and effort data
 - (e) Calculate nominal CPUE
 - (f) Share literature relevant to understanding the fishery population dynamics of JS, including unpublished literature if possible
 - (g) Discuss the possibility of linking footprint and effort data on sardines using GIS tools
 - (h) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
 - (i) Review the latest domestic JS stock assessment conducted by Japan

7.1.3 Japanese flying squid

- 34. The SWG JFS Lead, Dr. Kazuhiro Oshima (Japan), reported on the SWG JFS' intersessional activities. The SWG JFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), evaluated the spatial structure of JFS life history stages and stocks relative to fisheries, conducted a literature review about the influence of environmental variables on the life history and biology of JFS, reviewed the results of Japan's JFS domestic

stock assessment conducted since 1999, summarized potential challenges to conducting a stock assessment for JFS in the Convention Area, and updated the species summary document for JFS.

35. The SWG JFS Lead presented the species summary document for JFS (NPFC-2022-SC07-WP09).
36. The SC reviewed and endorsed the species summary document for JFS (Annex J).
37. The SC discussed future tasks for the SWG JFS and agreed on the following:
 - (a) Update the species summary
 - (b) Discuss potential data sharing needs
 - (c) Share data, including unpublished data if possible
 - (d) Update and review Members' JFS catch and effort data
 - (e) Share literature relevant to understanding the fishery population dynamics of JFS, including unpublished literature if possible
 - (f) Continue research on the spatial structure of the JFS life history and stock relative to the fishing footprint
 - (g) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
 - (h) Discuss the possibility of linking footprint and effort data on JFS using GIS tools
 - (i) Review the latest domestic JFS stock assessment conducted by Japan

7.1.4 *Blue mackerel*

38. The SWG BM Lead, Dr. Shota Nishijima (Japan), reported on the SWG BM's intersessional activities. The SWG BM has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), reviewed the species identification method used by Japan to distinguish BM and chub mackerel, discussed a data sharing template for BM, reviewed the catch composition of BM and chub mackerel in the Chinese and Japanese fisheries, reviewed research by Russia to differentiate chub mackerel and blue mackerel using the Japanese species identification method, updated the species summary document, reviewed the methods and results of Japan's domestic BM stock assessment, summarized the potential challenges to conducting a stock assessment for BM in the Convention Area, and discussed and agreed to the separation of fishery data such as catch-at-age and abundance indices by chub mackerel and BM.
39. The SWG BM Lead presented the species summary document for BM (NPFC-2022-SC07-WP10).

40. The SC reviewed and endorsed the species summary document for BM (Annex K).
41. The SC discussed future tasks for the SWG BM and agreed on the following:
- (a) Update the species summary
 - (b) Discuss potential data sharing needs
 - (c) Share data, including unpublished data if possible
 - (d) Update Members' estimated catch and effort for BM
 - (e) Update Members' data on catch composition of BM and chub mackerel
 - (f) Review historical catch and estimate the proportion of BM and chub mackerel, if possible
 - (g) Review the feasibility of calculating the proportion of BM and chub mackerel catch by gear
 - (h) Collect data on size and/or age composition of BM, if possible
 - (i) Continue to explore options for distinguishing BM and chub mackerel catch
 - (j) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
 - (k) Review the latest domestic BM stock assessment conducted by Japan
42. China informed the SC about its research on the proportion of BM and chub mackerel catch. The SC requested China and other Members to provide information about catch composition of BM and chub mackerel to the next SWG BM and TWG CMSA07 meetings.
43. The SC agreed that the four SWGs on NFS, JS, JFS, and BM would discuss leadership of those groups intersessionally.

7.2 Identification of data needs and data gaps and strategies to fill those gaps

7.2.1 Spatial data summarized by year and 1 x 1 degree resolution

44. The SC noted the importance of spatial information to inform the Commission's management decisions and that this is reflected in the tasks of its SWGs on NFS, JS, JFS, and BM as well as the workplans of SSC PS and SSC BF-ME.
45. The SWG JS Lead presented annual and monthly CPUE indices for JS (NPFC-2022-SC07-WP11 (Rev. 1)). For the annual index, CPUE was calculated for each year by gear type for each Member. For the monthly index, CPUE was calculated two ways: for each month by gear type for each Member with effort being either the number of operational days or the number of sets of gear type.
46. The SC discussed the value of different measures of fishing effort to calculate CPUE, including

the number of days fished and total number of sets. CPUE based on the number of sets may be more stable than a CPUE based on the number of days fished, although a decision on which measure of fishing effort to use should be made on a case by case basis. It was pointed out that the number of sets may be a hyperstable measure of effort, so more analysis may be needed in order to determine the best measure of effort.

7.3 Stock assessment of NFS, JS, JFS, and BM

7.3.1 Top-down prioritization

47. The SC agreed that NFS is a priority for stock assessment, but that it was difficult to rank the four species according to top-down prioritization for stock assessment.

48. The SC agreed to task the SWGs for NFS, JS, JFS, and BM to work collectively to assess capacity to build stock assessment models for each species, and to present recommendations for the top-down prioritization of the stock assessment of these species at SC08.

7.3.2 Capacity

7.3.3 Funding availability

49. The SC agreed to defer discussions of the capacity and funding availability for the stock assessment of these species until SC08, when it will have received the recommendations of the respective SWGs.

Agenda Item 8. Progress in data collection, management and security

8.1 Information management and security regulations

50. The Compliance Manager, Ms. Judy Dwyer, provided an update on the ongoing work to develop an overarching policy for data use and management that pertains to the Commission and its subsidiary bodies (NPFC-2022-SC07-IP05).

8.1.1 Procedures for sharing code

51. The Chair presented a proposal to revise the SC's Regulations for Management of Scientific Data and Information aimed at facilitating the sharing of computer code (NPFC-2022-SC07-WP03).

52. The SC reviewed and endorsed the proposal. The SC recommends that the Commission adopt the revised Regulations for Management of Scientific Data and Information (Annex O).

8.2 Data collection

8.2.1 Information about species belonging to the same ecosystem or dependent/associated with target stocks

53. The SC noted that, in accordance with Article 10, paragraph 4(d), one of the functions of the SC shall be to assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks. The SC also noted, however, that the Commission has not made specific requests for advice on these topics.

8.2.2 Data gaps and needs that could be filled by an observer program

54. The Science Manager presented a summary of information regarding the existing scientific observer programs of Members and those of other RFMOs (NPFC-2018-SC03-WP03 (Rev. 1)) as of April 2018. For pelagic fisheries, there is no coordination in the Members' observer programs neither in terms of the type of observer program nor in coverage and data requirements. Russia, Korea and Chinese Taipei collect data on fishing vessels at sea by observers and electronic reporting system, respectively, while other Members carry out in-port scientific observations. Specifications for observer training, observer program design, number of observers and required data differ among Members. All "general" RFMOs (NAFO, NEAFC, SEAFO, SIOFA, SPRFMO) and CCAMLR have developed at least one observer program. Most general RFMO Observer Programs have been set up primarily to collect scientific data, but in three of six cases, it includes compliance tasks with one general RFMO focusing on a compliance observer program. Almost all RFMOs for highly migratory species have observer programs with both science and compliance components, but with different balances. The SSC PS has previously developed a template for identification of scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means, dividing the different types of data into four categories: data that can only be collected by observers at sea; data that can be collected by fishermen at sea; data which are preferably collected by observers, but a degree of cover can be achieved by other means; and data which can be collected equally well by other means.

8.2.3 Scientific needs for electronic monitoring

55. The SC noted that there remain some issues with electronic monitoring, including data storage, that require further discussion.

8.3 NPFC data management system (DMS)

56. The Data Coordinator, Mr. Sungkuk Kang, reported on the progress in the development of the SC-related data management system (NPFC-2022-SC07-IP02). Updates have been made to the Members Home, Significant dates/Events, Pacific Saury Weekly Report, Collaboration, and Annual reports sections. The NPFC GIS Map has recently been updated to include Pacific saury catch and effort data with sea surface temperature per grid from 1994 to 2021. At the request of the SSC BF-ME, the Secretariat has developed bottom fishing maps of combined, gear-

specific footprints by different gear types and time periods. These maps are available on the NPFC website. Work is ongoing to overlay VME maps over the bottom fishing maps.

57. The SC requested the Data Coordinator to add specific dates to the timestamps for posts on the Collaboration site.

Agenda Item 9. Scientific projects for 2023 and 2024

9.1 Ongoing/planned projects

9.2 New projects

9.3 Review and prioritization of projects

58. The Science Manager presented a draft list of scientific projects that were discussed during the meetings of the SC and its subsidiary bodies (NPFC-2022-SC07-WP04 (Rev.1)).

59. The SC reviewed the list of proposed scientific projects and endorsed it for consideration by the Commission (Annex P).

Agenda Item 10. Cooperation with other organizations

60. The Science Manager presented a compiled list of cooperation opportunities and requests from other organizations, for consideration by the SC (NPFC-2022-SC07-IP04 (Rev. 1)).

10.1 Reports on the joint NPFC-PICES activities since the SC06 meeting, including a report from PICES Secretariat

61. The Executive Secretary of the North Pacific Marine Science Organization (PICES), Dr. Sonia Batten, reported on recent and upcoming PICES activities of relevance to the NPFC (NPFC-2022-SC07-OP05), highlighting the following:

- (a) Participation by NPFC and PICES representatives at each other's annual meetings
- (b) NPFC representation to the joint Working Group on Small Pelagic Fish (WG 43)
- (c) Involvement by some NPFC scientists, including the Chair of the NPFC SC, in the Working Group on the Ecology of Seamounts (WG 47)
- (d) Co-sponsoring of a topic session, "Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management" by the NPFC at the PICES-2022 Annual Meeting in Busan, Korea in September 2022.
- (e) Co-convening by NPFC SC members of a workshop at PICES-2022 with members of WG 47 on "Distributions of pelagic, demersal and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions"
- (f) Co-sponsoring of the PICES-ICES-FAO Small Pelagic Fish Symposium
- (g) Plans to hold a PICES 2023 session on "Seamount biodiversity: VMEs and species

associated with seamounts in the North Pacific Ocean”

- (h) Agreement by the NPFC and PICES to hold a joint international course/workshop on VME indicator taxa identification, and approval of financial contributions of US\$15,000 from each organization

- 62. The Executive Secretary of PICES presented information about the Basin Scale Events to Coastal Impacts (BECI) project. The goal of BECI is to develop a coordinated monitoring system for the North Pacific Ocean that supports regional downscaled models that would help understand the effects of climate change on fisheries production. BECI is anticipated to be run as a PICES special project. The Executive Secretary of PICES invited the NPFC to support and cooperate with BECI and help it to achieve its goals that in turn would support greater understanding of the marine ecosystem and its effects on species of interest to the NPFC.
- 63. The SC expressed its support for the development and implementation of the BECI project in line with the *NPFC-PICES Framework for Enhanced Scientific Collaboration*.

10.2 Joint NPFC-PICES workshop/course on VME indicator identification

- 64. The Science Manager informed the SC that the VME indicator taxa identification course had been postponed due to the Covid-19 pandemic. The SC agreed to postpone the course further and suggested that if any Members other than the original planned host (Russia) are interested in hosting the course, they could express their interest to the Secretariat and initiate intersessional discussions on the subject.

10.3 SC representation at PICES meetings

10.3.1 Report on joint PICES-ICES-FAO small pelagic fish (SPF) symposium

- 65. The Science Manager provided a report on the PICES-ICES-FAO SPF symposium held in Lisbon, Portugal from 7 to 11 November 2022 (NPFC-2022-SC07-IP03). The theme of the symposium was “Small Pelagic Fish: New Frontiers in Science for Sustainable Management.” The NPFC co-sponsored the symposium and was represented by the SSC PS Chair (who was also a member of the Steering Committee of the SPF symposium) and the Science Manager.

10.3.2 SC representation in the joint PICES/ICES Working Group on Small Pelagic Fish (WGSPF)

- 66. Dr. Chris Rooper (Canada) provided a report on the activities of the joint PICES/ICES Working Group on Small Pelagic Fish in 2022 of relevance to the NPFC. These include:
 - (a) The PICES topic session on “Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management” co-sponsored by the NPFC

- (b) A WGSPF Business meeting prior to the PICES-2022 Annual Meeting
- (c) The PICES-ICES-FAO SPF symposium on “Small Pelagic Fish: New Frontiers in Science for Sustainable Management” co-sponsored by the NPFC
- (d) A workshop to plan reporting and follow-up projects to the PICES-ICES-FAO SPF Symposium
- (e) A proposal to hold a topic session on “improved detection and understanding of factors affecting changes in North Pacific forage communities and implications to ecosystems” at the 2023 PICES Annual Meeting

67. The SC noted the need for a new NPFC representative to the WGSPF, in addition to the SSC PS Chair, Dr. Toshihide Kitakado. The SC agreed to appoint the TWG CMSA Chair, Dr. Kazuhiro Oshima, as the NPFC’s representative.

10.3.3 Report on PICES topic session on SPF

68. Jhen Hsu provided a report on the PICES topic session on Small Pelagic Fish held in Busan, Korea on 27 September 2022. The session was co-sponsored by the NPFC and its theme was “Environmental variability and small pelagic fishes in the North Pacific.” The session comprised 12 talks and two posters in the poster session. At the session, Jhen Hsu presented research related to the joint CPUE standardization collaborative work done by the SSC PS.

69. The SC congratulated Jhen Hsu for winning the best oral presentation award from PICES’ Fisheries Science Committee for her presentation.

10.3.4 Process for selecting SC representatives at future scientific meetings

70. The SC Chair presented a proposal for a method to evaluate and rank nominations for SC representatives to be financially supported to participate in relevant scientific meetings (NPFC-2022-SC07-IP01).

71. The SC endorsed the proposed method and agreed that if there is any discrepancy among the rankings by the Chairs of the SC and its subsidiary bodies, they will work together to determine the best candidate to support.

72. The SC agreed to recommend that the Commission financially support the travel of one member of the SC or its subsidiary bodies to participate in the 2023 PICES Annual meeting in Seattle, USA, if necessary.

10.4 NPFC/NPAFC Memorandum of Cooperation and Work Plan

73. The Science Manager reminded the SC of the suggested revisions it made at the SC06 meeting

to the draft five-year Work plan to implement NPAFC/NPFC Memorandum of Cooperation, 2021-2025 (NPFC-2022-SC07-OP02).

74. The SC reviewed and reaffirmed its endorsement of the revised science-related items in the work plan. The SC recommends that the Commission endorse the revised science-related items of the five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (Annex Q).

10.4.1 Report on the NPAFC's multinational IYS survey in the North Pacific Ocean

75. The Executive Director of the NPAFC, Dr. Vladimir Radchenko, presented a progress report on the 2022 International Year of the Salmon (IYS) Winter High Seas Research Expedition in the North Pacific Ocean (NPFC-2022-SC07-OP01). Five expedition vessels from Canada, Russia, and the United States covered more than 1.5 million km² by a regular integrated survey to study Pacific salmon distribution and winter ecology from February to April 2022. These vessels spent 182 days at sea including 96 days on survey, completed 126 survey stations, and caught 1,623 salmon, mostly sockeye (46.1%) and chum (35.5%). Catches of NPFC species of interest were rare due to the survey's limitation to northern and eastern parts of the NPAFC Convention Area. The Executive Director of the NPAFC expressed the NPAFC's appreciation for the financial, planning and information-sharing contributions made by the NPFC to the research expedition.

10.5 FAO ABNJ Deep-sea fisheries project

76. Dr. Tony Thompson (FAO) presented an update on the ABNJ Deep Sea Fisheries (DSF) Project (NPFC-2022-SC07-OP04). The work of the project has four main components: strengthening and implementing regulatory frameworks, strengthening effective management of deep-sea fisheries, cross-sectoral interactions on deep-sea fisheries, and knowledge management and communication. An inception workshop will be held in January 2023. The initial activities include development of an e-learning package for the *Step-wise guide for the implementation of international legal and policy instruments related to deep-sea fisheries and biodiversity conservation in the areas beyond national jurisdiction*, review of the implementation of the Deep-sea Fisheries Guidelines, rapid assessment of stock status (including armorhead, alfonsino and sablefish), and preparation for a symposium on ecosystem production models and the prevention of ecosystem overfishing with RFMO partners. An overarching focus in year 1 of the project will be improved data collection by onboard observers for compliance and scientific purposes. The NPFC SC is invited to consider the planned activities of the DSF Project and to identify areas of common interest and cooperation.

10.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)

77. The Science Manager reminded the SC that at SC06, it recommended that the Commission consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement. However, due to postponement of the NPFC's 7th Commission meeting, the Commission has not yet been able to consider the recommendation.
78. The SC re-affirmed its support for the NPFC entering into an arrangement with FIRMS. The SC recommended that the Commission consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

10.7 Cooperation with other organizations

79. There was no discussion of cooperation with any other organizations.

Agenda Item 11. 2022-2026 Research Plan and Work Plan

11.1 Five-year Research Plan

11.2 Five-year Work Plan

80. The SC reviewed its 2022-2026 Five-Year Rolling Research Plan (NPFC-2022-SC07-WP01) and Work Plan (NPFC-2022-SC07-WP02). The Research Plan and the Work Plan of the SC and its subsidiary bodies are attached as Annex R.

Agenda Item 12. Other matters

12.1 Review of the Scientific Committee Terms of Reference (TOR)

81. The SC reviewed its TOR and determined that no changes are currently needed.

12.2 Coordination between SC and TCC

82. Based on the discussion above, the SC identifies the following as matters for coordination between the SC and the TCC and requests the Secretariat to inform the TCC:
- (a) Revision of CMMs 2021-05 and 2019-06 (Annexes L and M)
 - (b) Ambiguity around the referenced effort limits in Paragraph 4A, CMM 2021-05
 - (c) Draft Work plan to implement NPAFC/NPFC Memorandum of Cooperation (Annex Q)

12.2.1 Fishing effort indicators

83. No updates were provided.

12.3 Other issues

84. The EU provided an updated fisheries operation plan (FOP) and impact assessment for a chub mackerel fishery within the NPFC Convention Area (NPFC-2022-SC07-WP12). The updated fisheries operation plan and impact assessment include the most recent scientific information

available and take into account comments and suggestions made during previous Technical Working Group on Chub Mackerel Stock Assessment, Scientific Committee and Commission meetings. The EU FOP takes into account the current state of the art and information available regarding potential impacts of the fishing operations proposed on target and possible bycatch species, as well as on the marine ecosystem. In addition, the proposed EU FOP would allow, through a dedicated sampling program, the data collection and provision of valuable scientific information in a data-poor zone of the Convention Area, therefore it would contribute to more robust future stock assessments of chub mackerel in the Convention Area.

85. The SC reviewed the EU's updated fisheries operation plan and impact assessment for a chub mackerel fishery within the NPFC Convention Area and noted that the EU has provided all the requested information. The SC recommends that the Commission note the updated EU FOP submitted to SC7.
86. The SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.
87. Japan stated that the Japanese Government has implemented MSY-based management since 2020 for chub mackerel. Effort control of purse seiners operating in the Japanese EEZ under the stock recovery program has been carried out since 2003. The Kobe plot provided from the latest stock assessment result showed that the stock was overfished and overfishing occurred in the terminal year (2020). Future SSB (in 2030) was projected under catch by not only Japan but also China and Russia, which reported their catch to the NPFC. The proposed 20,000 mt of EU chub mackerel catch would not allow the achievement of the management objective of recovery of SSB to above SSB_{MSY} with a probability of 50% or more in light of the current stock status.

Agenda Item 13. Advice and recommendations to the Commission

88. Based on the recommendations from its SSCs and TWG CMSA, the SC recommends that the Commission:
 - (a) Endorse its 5-Year Rolling Research and Work Plans (Annex R).
 - (b) Endorse the proposed scientific projects (Annex P).
 - (c) Make the species summary documents publicly available on the NPFC's website.
 - (d) Consider the species summary documents as reference information when taking decisions on the management of the NPFC priority species (Annexes D-K), including the information about the trends in catch and effort and other scientific information relevant to management of NPA and SA.
 - (e) Consider the scientific meetings schedule for 2023 as described in paragraph 90.

Chub Mackerel

- (f) Extend the consultancy agreement with the external expert to support the TWG CMSA in selecting a model for stock assessment of chub mackerel in 2023.
- (g) Note the updated EU fisheries operation plan submitted to SC07.

Bottom Fish and Marine Ecosystems

- (h) Endorse the revised CMM 2021-05 (Annex L).
- (i) Endorse the revised CMM 2019-06 (Annex M).
- (j) Consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A in addition to the revisions recommended in paragraph 88(h).
- (k) Establish a scientific project for understanding the basis by which other RFMOs' encounter thresholds were determined by taxa and gear-type.
- (l) Co-sponsor the PICES 2023 session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" by contributing the equivalent of \$5,000 USD.

Pacific Saury

- (m) Endorse the stock assessment report (Annex N).
- (n) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
- (o) Consider the following to improve conservation and management of Pacific saury:
 - i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) based on historical catch is much larger than a TAC that would be based on the F_{MSY} catch approach ($B_{2022} * F_{MSY} = 205,000$ tons). The current biomass is much lower than B_{MSY} and the TAC for 2021-2022 did not reduce fishing mortality in recent years. A harvest control rule (HCR) that reduces F when biomass is low may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 403,000 tons). A reduction to the TAC for 2021-2022 would increase the probability of higher biomass and catch levels in the Pacific saury stock.
 - ii. An HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world. For example, if an HCR that reduces F linearly when biomass is below B_{MSY} is applied, the TAC calculated based on such an HCR ($B_{2022} * F_{MSY} * (B_{2022} / B_{MSY}) = 101,000$ tons) could be similar with the current catch (98,000 tons, preliminary as of mid-December 2022).
 - iii. Note, however, the performance of the above HCRs has not been evaluated by a formal MSE framework for Pacific saury. They were used as simple illustrations of common approaches used elsewhere.

Data Sharing

- (p) Adopt the revised Regulations for Management of Scientific Data and Information (Annex O).
- (q) Update the data shared by the SC, TWG CMSA, SSC BF-ME and SSC PS, including subsidiary SWGs, in accordance with their Work Plans.

Cooperation with Other Organizations

- (r) Financially support the travel of one member of the SC or its subsidiary bodies to participate in the 2023 PICES Annual meeting in Seattle, USA, if necessary.
- (s) Endorse the revised science-related items of the five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (Annex Q).
- (t) Consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

89. In relation to other tasks for the SC specified in CMMs, SC's rolling five-year work plan, SC's TOR, and the Convention, the SC informs the Commission of the following:

Chub Mackerel

- (a) The SC selected Dr. Kazuhiro Oshima (Japan) to serve as the TWG CMSA Chair.
- (b) The SC selected Dr. Qiuyun Ma (China) to serve as the TWG CMSA Vice Chair.
- (c) The TWG CMSA will select a model(s) for stock assessment of chub mackerel at its next meeting in 2023.
- (d) The TWG CMSA will develop a species summary document for chub mackerel.
- (e) The SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

Bottom Fish and Marine Ecosystems

- (f) The SC endorsed the field guide for identification of fishes of the Emperor Seamount Chain captured by bottom fisheries (NPFC-2022-SSC BFME03-WP08).
- (g) The SC endorsed the use of the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to the oreosomatid fish in the Emperor Seamounts area.
- (h) The SC will discuss the establishment of a formal procedure for changing species' scientific and common names used by the NPFC, including how to handle the issue of a species not having a 3-letter ASFIS code in FAO, at SC08.
- (i) The SC endorsed the process proposed by Canada in NPFC-2022-SSC BFME03-WP03 as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area, and Canada's application of this method in the eastern part of the Convention Area.

Pacific Saury

- (j) The SC endorsed the revised [Terms of Reference of the SSC PS](#).
- (k) The SC Chair expressed her intention to work with the Secretariat and the SSC PS to develop a summary of species information about Pacific saury that is similar in format to

the species summary documents prepared for other priority species.

Other Priority Species

- (l) The SC will update the species summaries of NFS, JFS, JS and BM.
- (m) The SC will discuss the top-down prioritization of the stock assessment of NFS, JFS, JS and BM, as well as the capacity and funding availability for the stock assessment of these species, at its next meeting.

Data Collection and Sharing

- (n) The SC adopted the [terms of reference for sharing VME data](#).
- (o) The SC adopted the [template for sharing VME data](#).
- (p) The SC will continue discussions on the establishment of an observer program in the NPFC Convention Area.

Cooperation with Other Organizations

- (q) The SC expressed its support for the development and implementation of the BECI project in line with the *NPFC-PICES Framework for Enhanced Scientific Collaboration*.
- (r) The SC agreed to postpone the joint NPFC-PICES course on VME indicator identification.
- (s) The SC selected Dr. Kazuhiro Oshima as a NPFC representative to the PICES/ICES WGSPF in addition to the SSC PS Chair, Dr. Toshihide Kitakado.
- (t) The SC developed a [guideline](#) for the evaluation and ranking of nominations for SC representatives to be financially supported to participate in relevant scientific meetings.

Performance Review

- (u) The SC tasked its subsidiary bodies, including the four informal small working groups, pending the approval of the report by the Commission, to review relevant recommendations from the Performance Review report at their intersessional meetings or through email correspondence in 2023, evaluate their ability and necessary timelines to achieve the objectives in those recommendations, and to report on the outcomes of their reviews at the SC08 meeting.

Agenda Item 14. Next meeting

90. The SC suggested the following meeting schedule for 2023:

- (a) TWG CMSA07: at a date to be further discussed intersessionally
- (b) SSC PS11: 28-31 August 2023
- (c) SSC-BF-ME04: 7-9 December 2023
- (d) SSC PS12: 11-14 December 2023
- (e) SC08: 15-16 and 18-19 December 2023
- (f) TWG CMSA08: Late January 2024

91. The SC noted the dates of the 3rd SWG MSE PS meeting, 28 February – 1 March 2023, and recommends that the 4th SWG MSE PS meeting be held back-to-back with the next SSC PS meeting (e.g. on 1-2 September 2023).
92. The Secretariat will liaise with Chairs and Members to determine the format and venue of the scientific meetings scheduled for 2023.
93. The SC's subsidiary bodies will hold informal web meetings to check progress and plan intersessional work, when needed.

Agenda Item 15. Press release

94. The SC endorsed the press release for publication on the NPFC website after the meeting.

Agenda Item 16. Adoption of the Report

95. The SC07 report was adopted by consensus.

Agenda Item 17. Close of the Meeting

96. The meeting closed at 10:55 on 20 December 2022, Tokyo time.

Annexes:

Annex A – Agenda

Annex B – List of documents

Annex C – List of participants

Annex D – Species summary for North Pacific armorhead

Annex E – Species summary for splendid alfonsino

Annex F – Species summary for sablefish

Annex G – Species summary for blackspotted and rougheye rockfishes

Annex H – Species summary for neon flying squid

Annex I – Species summary for Japanese sardine

Annex J – Species summary for Japanese flying squid

Annex K – Species summary for blue mackerel

Annex L – Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean

Annex M – Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean

Annex N – Stock Assessment Report for Pacific Saury

Annex O – Revised Regulations for Management of Scientific Data and Information

Annex P – Scientific projects

Annex Q – Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

Annex R – Five-Year Research Plan and Work Plan of the Scientific Committee

Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Meeting arrangements

Agenda Item 4. NPFC Performance Review recommendations for the Scientific Committee

Agenda Item 5. Review of reports and recommendations from the Small Scientific Committees (SSC BF-ME and SSC PS) and the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

5.1 Technical Working Group on Chub Mackerel Stock Assessment

5.2 SSC on Bottom Fish and Marine Ecosystems

5.3 SSC on Pacific Saury

5.3.1 Selection of vice-chair of SSC PS

Agenda Item 6. Report and recommendations from the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

Agenda Item 7. Priority species

7.1 Summary of progress on the remaining four priority species

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7.1.2 Japanese sardine

7.1.3 Japanese flying squid

7.1.4 Blue mackerel

7.2 Identification of data needs and data gaps and strategies to fill those gaps

7.2.1 Spatial data summarized by year and 1 x 1 degree resolution

7.3 Stock assessment of NFS, JS, JFS, and BM

7.3.1 Top-down prioritization

7.3.2 Capacity

7.3.3 Funding availability

Agenda Item 8. Progress in data collection, management and security

8.1 Information management and security regulations

8.1.1 Procedures for sharing code

8.2 Data collection

8.2.1 Information about species belonging to same ecosystem or dependent/associated with target stocks

8.2.2 Data gaps and needs that could be filled by an observer program

8.2.3 Scientific needs for electronic monitoring

8.3 NPFC data management system (DMS)

Agenda Item 9. Scientific projects for 2023 and 2024

- 9.1 Ongoing/planned projects
- 9.2 New projects
- 9.3 Review and prioritization of projects

Agenda Item 10. Cooperation with other organizations

- 10.1 Reports on the joint NPFC-PICES activities since the SC06 meeting, including a report from the PICES Secretariat
- 10.2 Update on the joint NPFC-PICES workshop/course on VME indicator identification
- 10.3 SC representation at scientific meetings
 - 10.3.1 Report on joint PICES-ICES-FAO small pelagic fish (SPF) symposium
 - 10.3.2 SC representation in joint PICES/ICES Working Group on Small Pelagic Fish (WGSPF)
 - 10.3.3 Report on PICES topic session on SPF
 - 10.3.4 Process for selecting SC representatives at future scientific meetings
- 10.4 NPFC/NPAFC Memorandum of Cooperation and Work Plan
 - 10.4.1 Report on the NPAFC's multinational IYS survey in the North Pacific Ocean
- 10.5 FAO ABNJ Deep-sea fisheries project
- 10.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)
- 10.7 Cooperation with other organizations

Agenda Item 11. 2022-2026 Research Plan and Work Plan

- 11.1 Five-year Research Plan
- 11.2 Five-year Work Plan

Agenda Item 12. Other matters

- 12.1 Review of the Scientific Committee Terms of Reference (TOR)
- 12.2 Coordination between SC and TCC
 - 12.2.1 Fishing effort indicators
- 12.3 Other issues

Agenda Item 13. Advice and recommendations to the Commission

Agenda Item 14. Next meeting

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MEETING INFORMATION PAPERS

Document Number	Title
NPFC-2021-SC07-MIP01	Meetings Information
NPFC-2021-SC07-MIP02	Provisional Agenda
NPFC-2021-SC07-MIP03 (Rev. 2)	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Document Number	Title
NPFC-2018-SC03-WP03 (Rev. 1)	Report on the existing observer programs of NPFC Members and those of other RFMOs
	Terms of Reference for SC
	Report of the NPFC Performance Review Panel

WORKING PAPERS

Document Number	Title
NPFC-2022-SC07-WP01	Revised NPFC SC Research Plan
NPFC-2022-SC07-WP02	Five-Year Work Plan of the Scientific Committee
NPFC-2022-SC07-WP03	Revised Regulations for Management of Scientific Data and Information
NPFC-2022-SC07-WP04 (Rev. 1)	Scientific projects
NPFC-2022-SC07-WP05	Summary of the 1st joint meeting of SWG NFS, JS, JFS, and BM
NPFC-2022-SC07-WP06	Summary of the 2nd joint meeting of SWG NFS, JS, JFS, and BM
NPFC-2022-SC07-WP07	Species summary for neon flying squid
NPFC-2022-SC07-WP08	Species summary for Japanese sardine
NPFC-2022-SC07-WP09	Species summary for Japanese flying squid
NPFC-2022-SC07-WP10	Species summary for blue mackerel
NPFC-2022-SC07-WP11 (Rev. 1)	Catch per unit effort calculations: Japanese Sardine
NPFC-2022-SC07-WP12	Fisheries Operation Plan and impact assessment for a Chub mackerel fishery within the NPFC Convention area

INFORMATION PAPERS

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NPFC-2022-SC07-IP01	Evaluation and ranking of nominations for SC representatives to be financially supported to participate in relevant scientific meetings
NPFC-2022-SC07-IP02	NPFC Data Management System
NPFC-2022-SC07-IP03	Report on joint PICES-ICES-FAO small pelagic fish (SPF) symposium
NPFC-2022-SC07-IP04 (Rev. 1)	A compiled list of cooperation opportunities and requests from other organizations
NPFC-2022-SC07-IP05	NPFC data sharing and data security protocol

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NPFC-2022-SC07-OP01	Progress report on the 2022 IYS Winter High Seas Research Expedition
NPFC-2022-SC07-OP02	Five-year Work Plan (2021–2025) to Implement NPAFC/NPFC Memorandum of Cooperation
NPFC-2022-SC07-OP03	Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)
NPFC-2022-SC07-OP04	Deep-sea Fisheries Project – Update
NPFC-2022-SC07-OP05	Report on Joint NPFC-PICES activities for SC07, December 2022

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Species summary for North Pacific armorhead

North Pacific armorhead (*Pentaceros wheeleri*)

Common names: Pelagic armorhead, Slender armorhead (English); 五棘鯛 (Chinese); クサカリツボダイ (Japanese); 북방돛돔 (Korean); кабан-рыба (Russian)

Biological Information

North Pacific armorhead has a unique life history consisting of a pelagic larva phase and a demersal adult stage on the seamounts (Kiyota et al. 2016). Distribution of the larva includes Gulf of Alaska to North Pacific Ocean off central California and south of Japan, with center of abundance at the Emperor Seamounts. Following their settlements in the seamounts, adults make morphological changes from the “fat” type to the “lean” type concurrent with their dietary shifts. Vertical distribution of the adults ranges from 300-500 m. Juveniles at the epipelagic stage mainly feeds on copepods, shifting the targets towards fish and large crustaceans with growth.

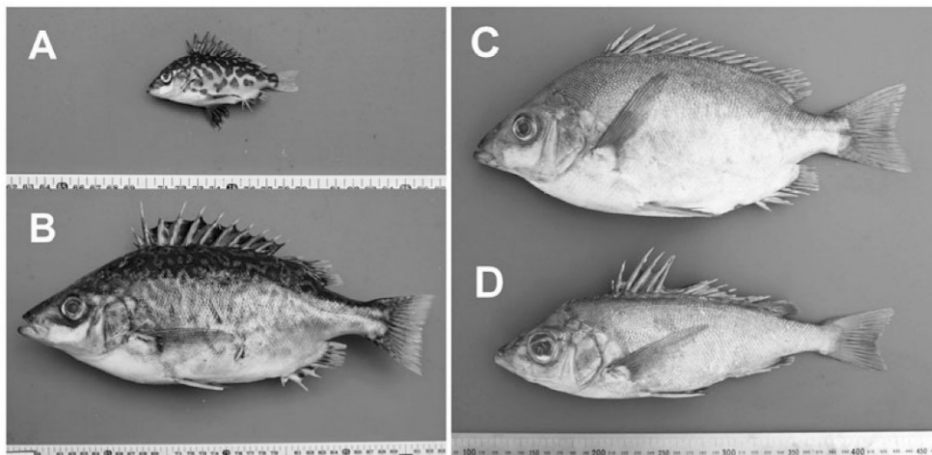


Figure 1: Photographs of *Pentaceros wheeleri*. A) Pelagic juvenile, B) pelagic subadult, C) demersal adult (fat type), D) demersal adult (lean type) (from Kiyota et al. 2016)

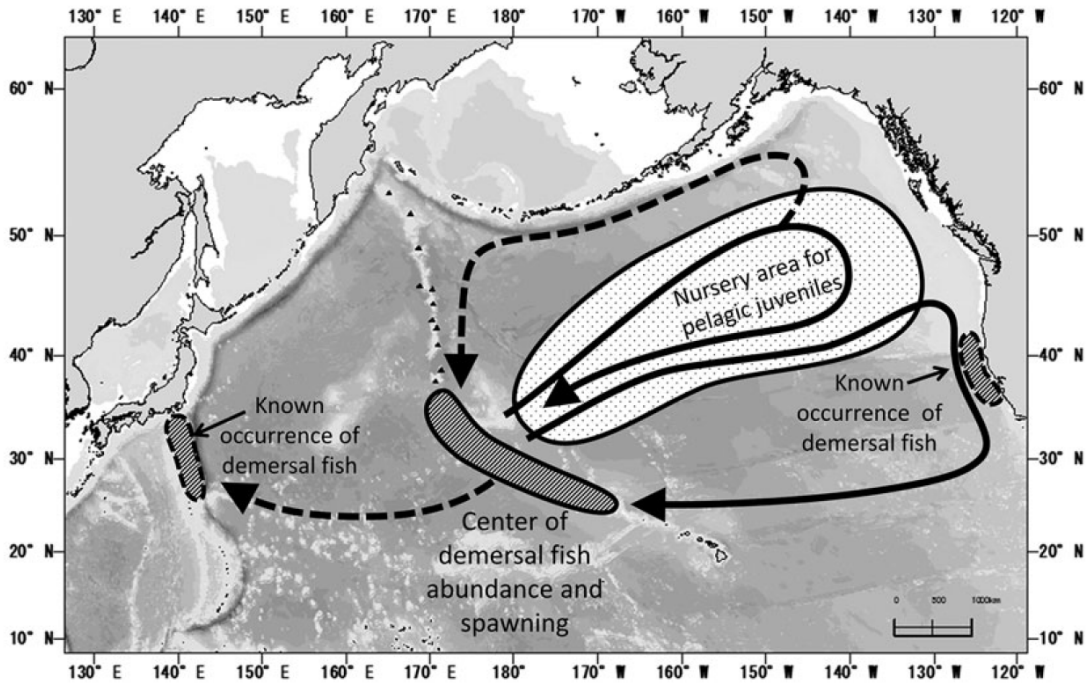


Figure 2: Known demersal habitats and hypothesized pelagic migration routes of *Pentaceros wheeleri* (Kiyota et al. 2016 Figure 4, modified from Boehlert and Sasaki 1988).

Fishery

Historical catches by Russia and Japan from the combined Emperor Seamounts were high and reached 100 thousand tons in 1970s, followed by a crash (Figure 3). Currently North Pacific armorhead is caught by Japan and Korea on the Emperor Seamounts using bottom trawls and gillnets. This fishery is a potential source of significant adverse impacts on vulnerable marine ecosystems due to bottom contact gear.

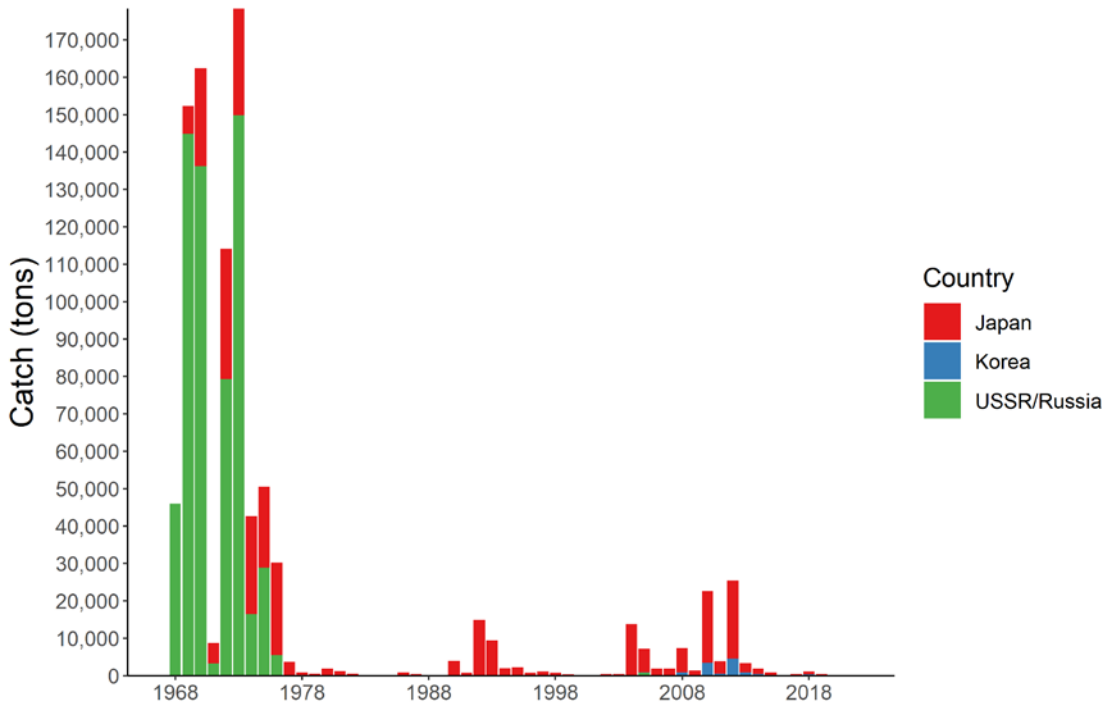


Figure 3: Historical trends of North Pacific armorhead catches in NPFC waters. The annual amounts of catch by each country are shown by the bar plot.

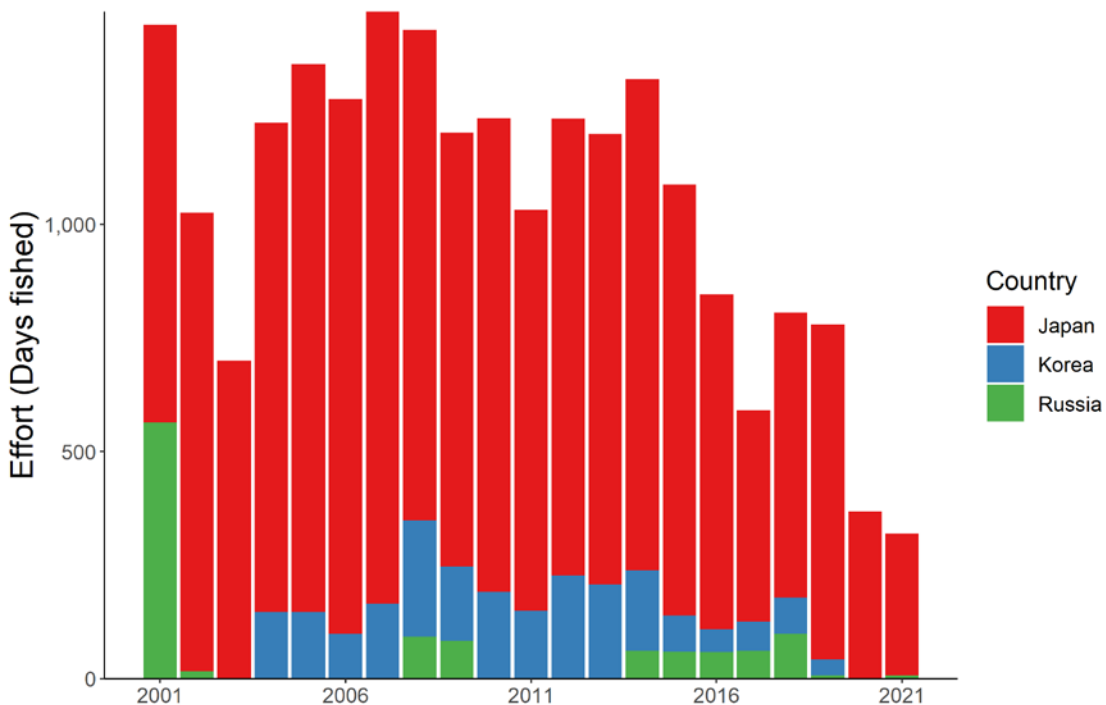


Figure 4. Historical fishing effort for North Pacific armorhead. The annual fishing efforts by each country are shown by barplot. The efforts are calculated by the total fishing days operated during the year

Assessment

There is no current or accepted assessment for North Pacific armorhead.

There are no biomass estimates available for this species in NPFC waters. An age- or length-structured stock assessment is unlikely to be feasible given the life history of North Pacific armorhead. Data limited approaches may be examined in the future.

Management

Active Management Measures

The following NPFC conservation and management measures pertain to this species:

- CMM 2021-05 For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Table 1: Current status of management measures

Item	Status	Description
Biological reference point	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	Upper limit: 15,000 tons (only for Japan), No operation from November to December, Restriction of trawl mesh size
Harvest control rule	Not accomplished	Catch limit depending on the recruitment strength
Other	Intermediate	No expansion of fishing beyond established areas, No operation in the designated areas, No more increase in the fishing vessels

In 2019, an adaptive management plan was implemented for North Pacific armorhead (NPFC-2019-SSC BF02-WP05, CMM 2019-05). This plan specifies data collection via an annual monitoring survey to be conducted in March-June each year on Koko, Yuryaki, Kammu and/or Colahan Seamounts. If the survey finds evidence of strong recruitment (see CMM 2021-05 and NPFC-2019-SSC BF02-IP01 for details) some areas in the Emperor Seamounts are closed and a 12,000 ton catch limit is encouraged. In low recruitment years, a 700 ton catch limit is encouraged.

Data Availability

Table 2: Catch data

Data	Country	Fishery	Year	Comments
Annual catch	Japan	Trawl	1969-present	
		Gillnet	1990-present	
	Korea	Trawl	2004-2019	
	Russia	Trawl	1970-1987; 1997; 2001-2002; 2005-2006; 2011; 2013	
CPUE	Japan	Trawl	1970-present	Logbook data available
		Gillnet	2008-present	Logbook data available
	Korea	Trawl	2013-2019	Logbook data available
	Russia	Trawl	2001-2002; 2005-2006; 2011; 2013	

Table 3: Biological data

Data	Country	Year	Comments
Age	Japan		A preliminary daily ring analysis for ca. 300 fish
	Korea	2013-2019	
	Russia		
Length	Japan	2009-present	Protocol revised (see NPFC-2018-SSC BF01-WP03)
	Korea	2013-2019	
	Russia		
Maturity	Japan	2013-present	
	Korea	2013-2019	
	Russia	1970-1987; 1997; 2011; 2013	

References

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- Kiyota M., Nishida K., Murakami C. and Yonezaki S. 2016. History, biology, and conservation of Pacific endemics 2. The North Pacific armorhead, *Pentaceros wheeleri* (Hardy, 1983) (Perciformes, Pentacerotidae). *Pacific Science* 70(1): 1-20.

Species summary for splendid alfonsino

Splendid alfonsino (*Beryx splendens*)

Common names: Splendid alfonsino (English); 红眼金鲷 (Chinese); キンメダイ (Japanese); 빛금눈돔 (Korean); Низкотельный берикс (Russian)

Biological Information

Global distribution ranges from tropical to temperate oceans. Historical catch records in the Emperor Seamount suggest the distribution from Nintoku (45 °N) to Hancock (30 °N). Settlement occurs following a certain period of the pelagic life stage. Adults show a vertical distribution from 200 to 800 m with diel vertical migration, feeding on crustaceans, cephalopods, and fish during the night. Limited information is available for recruitment and reproduction processes in the Emperor Seamounts, whereas the population in the Japanese coast shows 4–5 years to sexually mature and spawning occurs during summer (Shotton 2016).

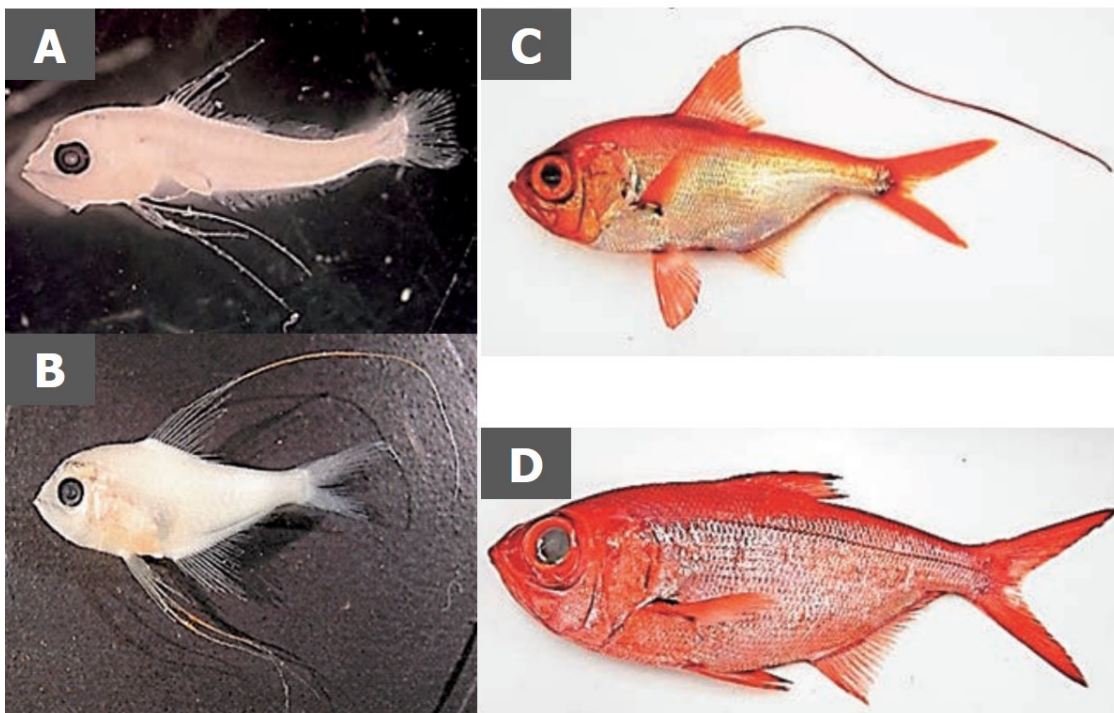


Figure 1: Photographs of *Beryx splendens* on different developmental stages A) postlarva, B) juvenile, C) young, D) adult (from Watari et al. 2017)

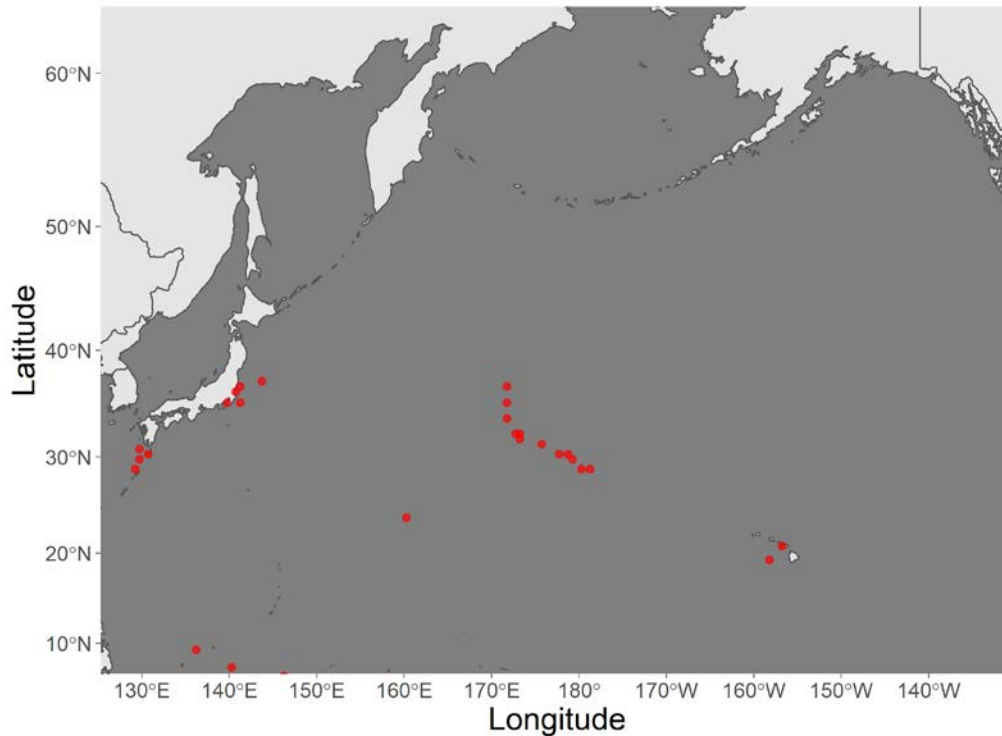


Figure 2: Known distribution of *Beryx splendens* around NPFC waters. Points indicate observation data from original sources (AquaMaps 2019, October)

Fishery

Since the discovery of large populations of North Pacific armorhead in the Emperor Seamount in the late 1960s, Splendid alfonso has been exploited as an alternative resource to the armorhead due to the large temporal fluctuation of the armorhead population. The main fishing methods are bottom trawls and gillnets.

Historical catch record (Figure 3) shows the highest catch proportion by Japan, followed by Korea and Russia. Russia terminated their fishery nearly a decade ago. Fishing pressure somewhat reflects the recruitment condition of North Pacific armorhead. In 2010 and 2012, when high recruitment of the armorhead occurred, the annual catch decreased below 1,000 tons, whereas it increased up to 4,000 tons ever since then.

Size composition analysis from the catch data by Japanese trawlers suggests the substantial decrease in size of fish in catches over the past decade, raising the concern about growth and recruitment overfishing (Sawada et al. 2018).

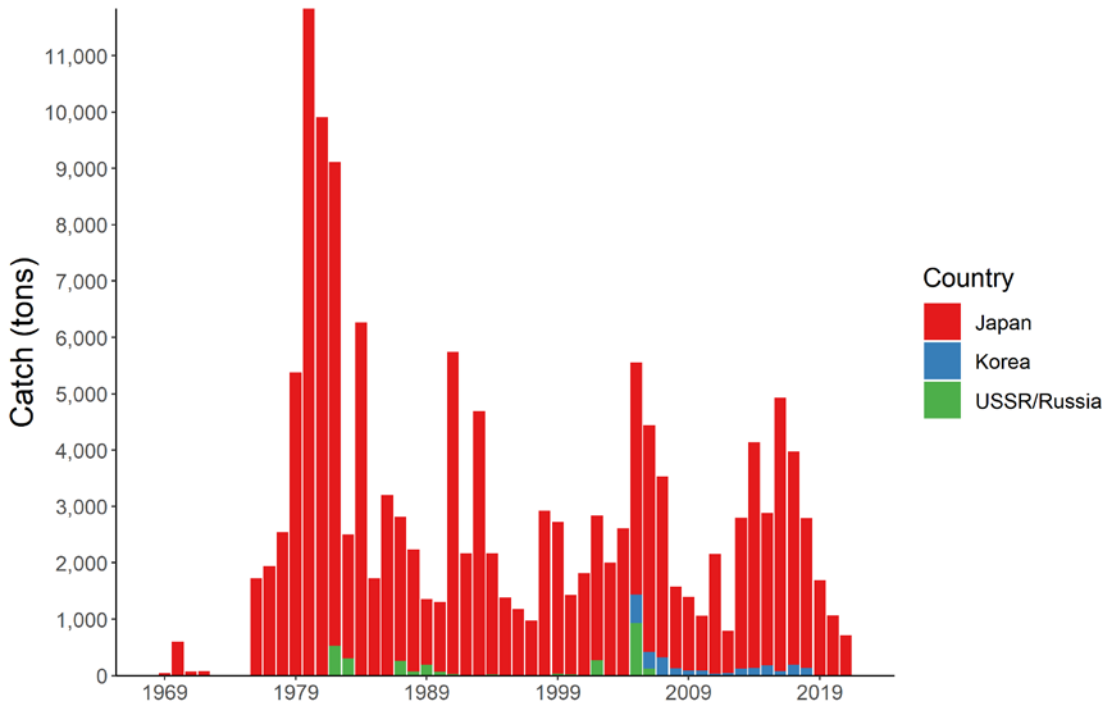


Figure 3: Historical trends of *Splendid alfonsino* catches in NPFC waters. The annual amounts of catch by each country are shown by the bar plot.

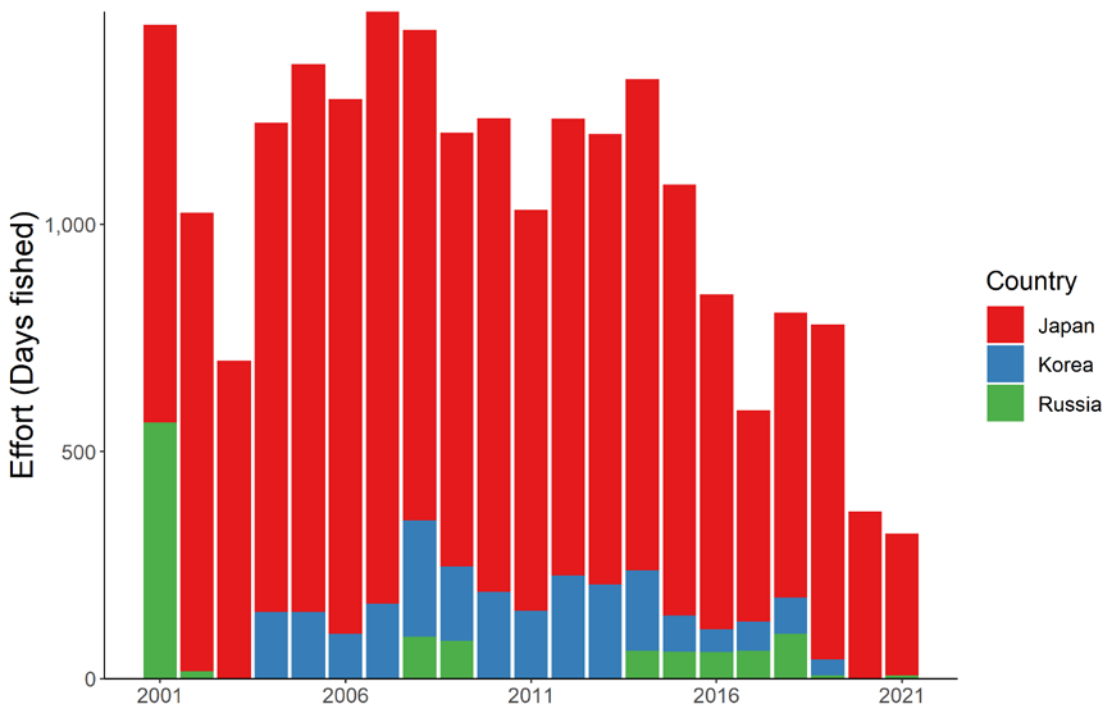


Figure 4. Historical fishing efforts for *Splendid alfonsino*. The annual fishing efforts by each country are shown by barplot. The efforts are calculated by the total fishing days operated during the year

Assessment

There are no biomass estimates available for *Splendid alfonsino* in NPFC waters.

An age- or length-structured stock assessment may be feasible given the life history of this species. Surplus production models developed by Japan in 2008 showed that the average fishing mortality is 20–28 % higher than the MSY level (Nishimura and Yatsu 2008). This analysis, however, remains unreliable as the estimated CPUE is biased due to target shifts between North Pacific armorhead and *Splendid alfonsino* and the estimated intrinsic population growth rate parameter was too high for long-lived deep-sea fish.

Data limited approaches, such as YPR or SPR analysis that do not require detailed resource parameters or fishing data, should be explored in the future.

Management

Active Management Measures

The following NPFC conservation and management measures pertain to this species:

- CMM 2021-05 For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Table 1: Current status of management measures

Item	Status	Description
Biological reference point	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	No operation from November to December, Restriction of trawl mesh size
Harvest control rule	Not accomplished	Not established
Other	Intermediate	No expansion of fishing beyond established areas, No operation in the designated areas, No more increase in the fishing vessels

Currently, there is no accepted harvest control rule for this species.

In 2016, the management measures were implemented, which includes limiting the fishing effort to the 2007's level, prohibiting fisheries from November to December (which corresponds to the spawning season for North Pacific armorhead) and not allowing fisheries in C-H Seamount and the southeastern part of Koko Seamount (for the protection of VMEs)

In 2019, an additional measure was adopted, which includes the regulation of the mesh size (trawl: > 13 cm) to protect juvenile fish of this species. Effectiveness of this measure yet to be clearly demonstrated (Sawada and Ichii 2020).

Data Availability

Table 2: Catch data

Data	Country	Fishery	Year	Comments
Annual catch	Japan	Trawl	1969-present	
		Gillnet	1990-present	
	Korea	Trawl	2004-2019	
	Russia	Trawl	1969-1988; 2002; 2005; 2006; 2010; 2011; 2013; 2019	
CPUE	Japan	Trawl	1970-present	Logbook data available
		Gillnet	2008-present	Logbook data available
	Korea	Trawl	2013-2019	Logbook data available
	Russia	Trawl	1969-1988; 2010; 2019	

Table 3: Biological data

Data	Country	Year	Comments
Age	Japan	2013-present	annual ring analysis
	Korea	2013-2017, 2019	
	Russia		
Length	Japan	2009-present	Protocol revised (see NPFC-2018-SSC BF01-WP03)
	Korea	2013-2019	
	Russia		
Maturity	Japan	2013-present	
	Korea	2013-2017, 2019	
	Russia	1969-1988; 2010; 2011; 2013; 2019	

References

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Shotton, R. (2016). Global review of alfonsino (*Beryx* spp.), their fisheries, biology and management. FAO Fisheries and Aquaculture Circular, (C1084), I.

Sawada, K., Nishida, K., Yonezaki, S. and Kiyota, M. (2018). Review of biology and fisheries of Splendid alfonsino *Beryx splendens*, especially in the Emperor seamounts area. NPFC-2018-SSC-BF01-WP03. 26 pp.

Sawada, K., and Ichii, T. (2020) Catch size composition of splendid alfonsino in the Emperor Seamounts area before and after the implementation of the mesh size regulation. NPFC-2020-SSC-BFME01-WP05 (Rev. 1). 3 pp.

Nishimura, A., & Yatsu, A. (2008, October). Application of surplus-production models to splendid alfonsin stock in the Southern Emperor and Northern Hawaiian Ridge (SE-NHR). In Fifth Intergovernmental Meeting on Establishment of New Mechanism for Management of High Seas Bottom Trawl Fisheries in the North Western Pacific Ocean (NWPBT/SWG-05), Tokyo, 17-18 October 2008 (pp. 1-11).

Species summary for sablefish

Sablefish (*Anoplopoma fimbria*)

Common names:

Black cod (USA & Canada)

ギンダラ, Gindara (Japan)

은대구, Eun-Daegu (Korea)

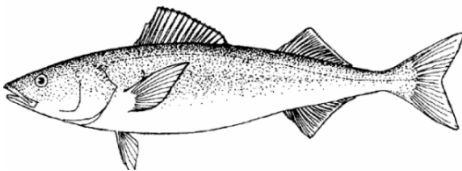


Figure 1. Sablefish (*Anaplopoma fimbria*).

Management

Active NPFC Management Measures

The following NPFC conservation and management measures (CMM) pertain to this species:

- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean
- CMM 2019-10 For Sablefish in the Northeastern Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Management Summary

The current management measure for sablefish specifies both catch and effort limits. The allowable catch of sablefish in the eastern portion of the Convention Area is based on a long-term mean of historical catches from seamounts by Canada. It allows for 34 mt to be landed each month for the 6 months of the fishing season (April to September). The fishery is also managed through input controls by only allowing a single vessel to fish in each month. The 1-3 Canadian vessels licensed to fish in the NPFC Convention Area are submitted to the NPFC Secretariat annually.

Table 1: Current status of management measures

Convention or Management Principle	Status	Comment or Consideration
Biological reference point(s)	Unknown	Established for USA and Canada assessments
Stock status	Known	Healthy (in USA and Canada assessments)
Catch limit	Known	Allowable catch of 34 mt per month (6 month season)
Harvest control rule	Undefined	Established for USA and Canada assessments
Other	Known	Effort control (single vessel per month)

Assessment

Although genetic and other evidence indicates there is a single stock of sablefish in the eastern North Pacific Ocean (including the NPFC Convention Area), three stock assessments are carried out in the three domestic jurisdictions Alaska (U.S.A.), British Columbia (Canada) and the U.S. West Coast (U.S.A.) where sablefish are harvested.

Canada uses a management strategy evaluation (MSE) process to generate recommended harvest each year. Underlying the MSE is a statistical catch-at-age structured operating model (stock assessment model) that gets updated on a 3 – 5 year cycle (DFO 2016, DFO 2020). A new assessment by Canada is scheduled to be released in early 2023. The USA conducts two stock assessments (one for Alaska and one for the US West Coast). Both are conducted using age-structured models and are routinely updated. The current Alaska assessment (Goethel et al. 2021) and most recent USA West Coast assessment (Haltuch et al. 2019, Kapur et al. 2021) are available online.

No stock assessment is conducted for the portion of the sablefish population found in the NPFC Convention area.

Data

Surveys

Canada has conducted two longline trap surveys in British Columbia waters. From 1990-2009 a standardized trap survey was conducted at set stations annually. From 2003 to the present DFO conducts a stratified random trap survey along the outer shelf and slope of the BC coast. Both of these surveys generate a fishery independent CPUE as well as biological data that is used in the assessment. In Alaska, three survey indices are available for use in assessing the status of the

sablefish population. There is a longline survey conducted at standard survey stations that provides a relative index of abundance. It has been conducted at depths from 200-1000 m annually since 1978 (cooperatively with Japan from 1978-1994). Bottom trawl surveys are conducted annually or biennially in the three main ecosystems in Alaska since 1982. The U.S. West Coast primarily uses fishery independent survey data from the west coast groundfish bottom trawl survey conducted from 2003-2018 over depths of 55 to ~1300 m as an index of sablefish abundance. The bottom trawl survey follows a random-stratified survey design with four vessels (in most years) conducting the survey annually. The trawl survey data is analyzed with the VAST model (Thorson 2019) to produce the index of abundance for sablefish.

There is currently no survey conducted in the eastern NPFC Convention Area that captures or monitors sablefish populations.

Fishery

The Canadian high seas Sablefish fishery typically operates at 1-4 seamounts in the commission area (Cobb, Eickleberg, Warwick and Brown Bear seamounts). Historically other seamounts have been fished for sablefish both inside and outside Canada's EEZ.

Fishing is conducted with longlined traps. Since 2014 a maximum of 3 vessels per year have been allowed to fish in NPFC waters. Historically the number of fishing vessels has averaged <3 per year (since 2008). The number of fishing days is the number of unique calendar days during which gear was set. The number of fishing days has averaged from about 25 to greater than 100, but in most years has averaged between 50 and 75 (Figure 2).

No Canadian vessels have chosen to fish for Sablefish in the Convention Area since 2020. This is likely due to a combination of economics (high fuel prices and the large distance to the seamounts), the availability of quota in the domestic fishery which is easier to access and hesitancy about the requirements under the implementation of the new NPFC AIS policy.

Both Canada and the U.S.A. have large domestic fisheries that target sablefish inside their EEZ's. Sablefish is also captured as bycatch in domestic trawl fisheries in Canada and the U.S.A.

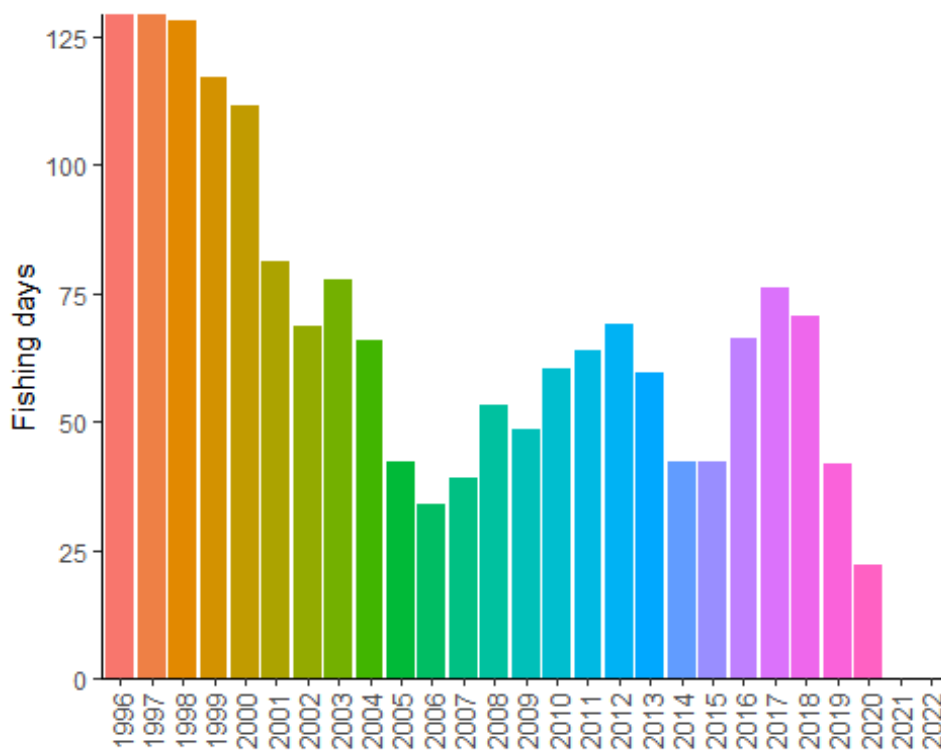


Figure 2. Fishing effort (in number of fishing days) for the Sablefish longline trap fishery conducted in NPFC waters (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

Output controls limit the amount of fish that can be landed during a trip. Authorized vessels are subject to monthly vessel limits of 34 mt of Sablefish, 2.3 mt of combined Rougheye and Blackspotted rockfish and 0.45 mt of other rockfish, sole and flounder (all in round weight). These measures have been in place since 2011.

Catches of Sablefish from NPFC region seamounts has ranged from an average of about 10 mt per year in 2005-2008 to about 67 mt in 2017 (Figure 3). Average annual catches were relatively low from 2002 to 2016 at NPFC seamounts and then increased in 2017-2018, with a decline to low levels in the last years. This increase in part probably reflects shifting effort due to closures of seamounts within Canada's EEZ. An examination of coastwide shifts in the spatial pattern of fishing effort showed that fishing effort has become concentrated on Cobb Seamount, with increasing effort in shallower waters relative to the past (Figure 4).

There was no fishing effort at seamounts during 2021 or 2022 resulting in no catch.

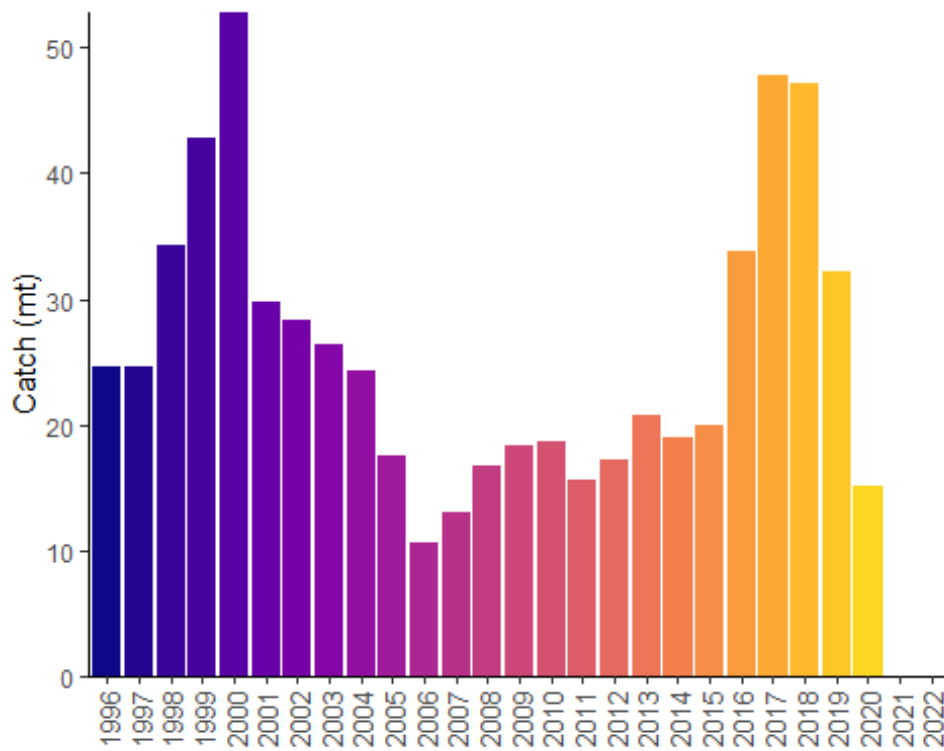


Figure 3. Landings of sablefish in the Canadian Sablefish fishery in NPFC region (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

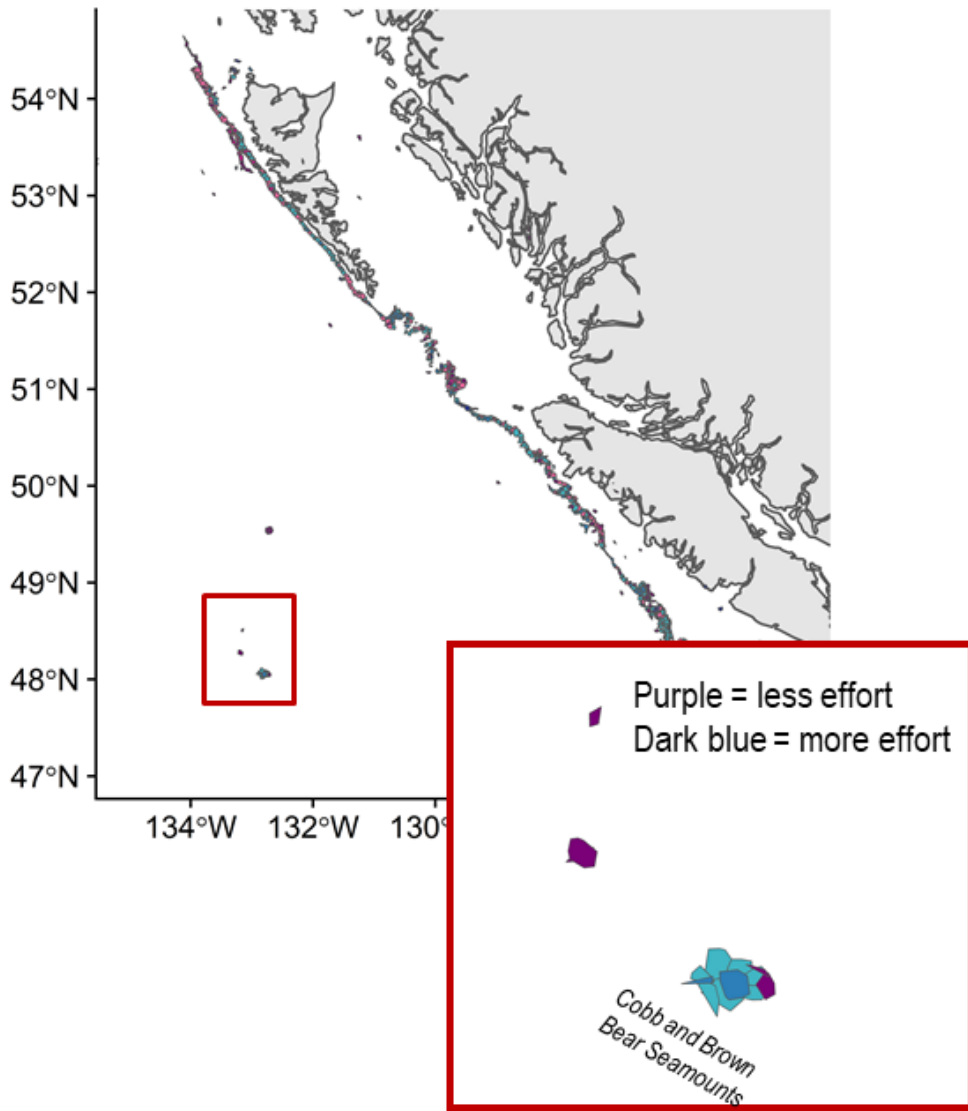


Figure 4. Relative change in spatial distribution of effort for Sablefish trap fishery from 2010-2017 to 2018-2019. Inset shows seamounts in the NPFC Convention Area.

Catch per unit of effort (mt/fishing days) for Sablefish has been increasing over the last 10 years (Figure 5), averaging 0.37 mt/fishing day (CV = 48%). CPUE was not calculated in 2022, but has generally been increasing since 2012.

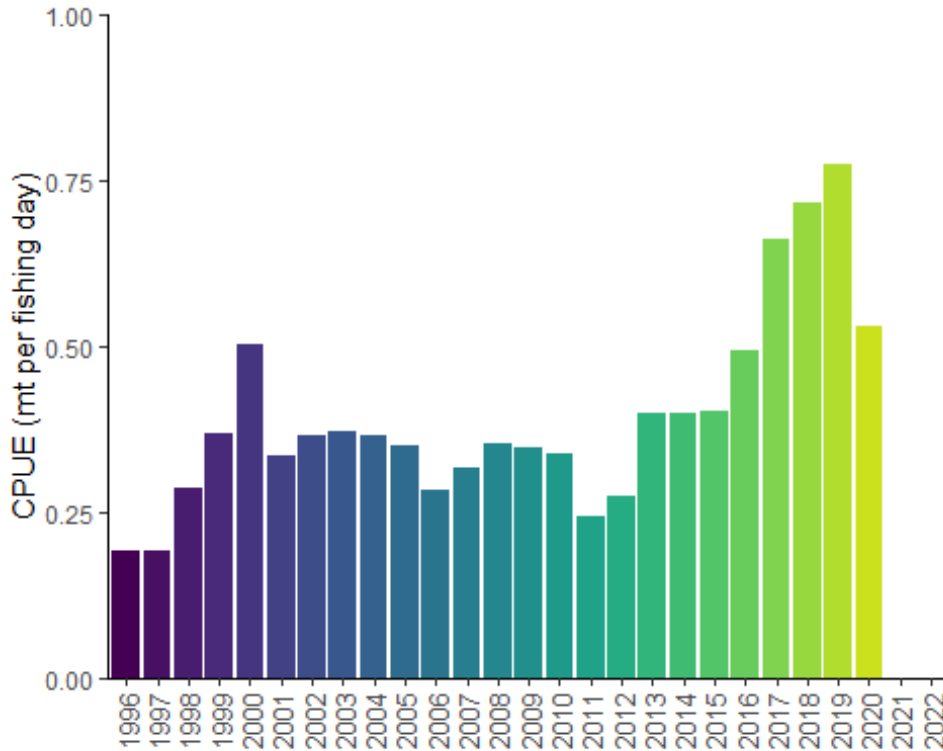


Figure 5. Catch per unit of effort for Canadian Sablefish fishery in NPFC region. Data are averaged across 3 years to comply with data privacy restrictions.

Biological collections

Under the seamount fishing protocol, 5 randomly selected fish per trip are saved by the vessel for sampling when it returns to port. These sablefish are sampled for length, weight and sex. Otoliths are collected for age estimation.

In 2020 due to COVID 19 restrictions, there were no biological samples collected from Sablefish captured in the Convention Area. Historical data will be provided to the NPFC Science Committee, when and as required, in conjunction with the NPFC's Interim Guidance for Management of Scientific Data Used in Stock Assessments.

Domestic fisheries in the U.S.A. and Canada also collect biological data. Data including length, weight and sex are collected from the scientific survey and by observers and dockside samplers from the commercial fisheries. Otoliths for estimating fish ages are also collected from both the surveys and the fisheries.

Table 2: Data availability from Members regarding blackspotted and rougheye rockfishes

Data	Source	Years	Comment
Catch	Canada	1965-present	Catches from national waters and convention area
	USA	~1960-present	Catches in national waters
CPUE	Canada	~1988-present	
	USA	~1988-present	
Survey	Canada	1990-2009	Longline trap standard survey
	Canada	2003-present	Longline trap random survey
	USA	1978-present	Alaska longline survey
	USA	1982-present	Alaska bottom trawl surveys
	USA	2003-present	West Coast bottom trawl survey
Age data	Canada	variable	Commercial and survey catches, including NPFC Convention Area
	USA	variable	Commercial and survey catches
Length data	Canada	variable	Commercial and survey catches, including NPFC Convention Area
	USA	variable	Commercial and survey catches
Maturity/fecundity	Canada	variable	Commercial and survey catches in national waters
	USA	variable	Research cruises in national waters

Special Comments

None

Biological Information

Distribution

Sablefish are widely distributed throughout the Pacific Ocean from northern Mexico to the Gulf of Alaska, westward to the Aleutian, and northward into the Bering Sea (Figure 6; Wolotira et al. 1993). They are also found along the western margin of the Pacific Ocean from southern Japan through the Kamchatka Peninsula and northward into the Bering Sea. Adult sablefish occur along the continental slope, shelf gullies, and in deep fjords, generally at depths greater than 200 m. Juvenile sablefish spend their first two to three years on the continental shelf at shallower depths. Spawning is generally in the winter and spring (October-April) and occurs near the shelf break. Spawning timing generally occurs earlier in the south (October-February in California) and later in the north (January – April in Alaska). Eggs are found at depth and larvae are found in surface waters (Shotwell et al. 2020).

Life history

Larval sablefish feed on zooplankton prey. Juveniles shift from pelagic to benthic prey including fishes and invertebrates. Adults consume mostly benthic fishes and invertebrates. Sablefish mature at 4 to 5 years. In the eastern Pacific, Sablefish have traditionally been thought to form two populations based on differences in growth rate, size at maturity, and tagging studies. The northern population inhabits Alaska and northern British Columbia waters and the southern population inhabits southern British Columbia, Washington, Oregon, and California waters, with mixing of the two populations occurring off southwest Vancouver Island and northwest Washington. However, recent genetic work by Jasonowicz et al. (2017) found no population sub-structure throughout their range along the US West Coast to Alaska, and suggested that observed differences in growth and maturation rates may be due to phenotypic plasticity or are environmentally driven. Tagging evidence suggests that the sablefish inhabiting seamounts in the NPFC Convention Area are not distinct from the coast wide sablefish population.

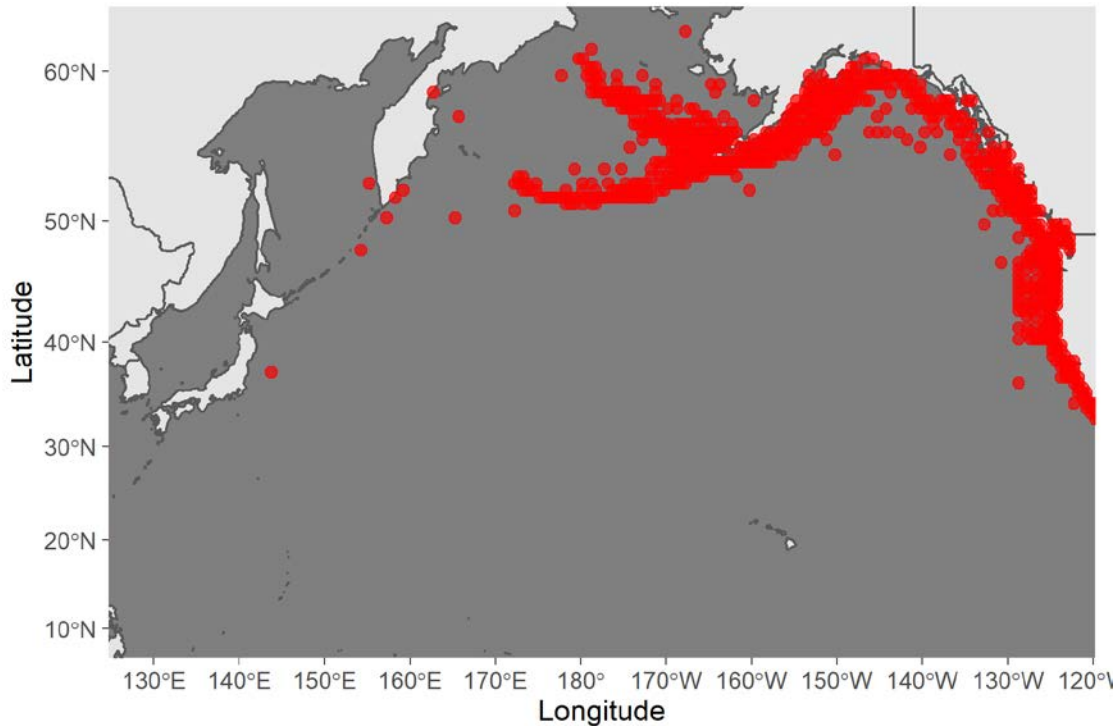


Figure 6. Map of distribution of sablefish in the North Pacific.

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Species summary for blackspotted and rougheye rockfishes

Blackspotted and Rougheye Rockfishes

(Sebastes melanostictus and Sebastes aleutianus)

Common names:

アラメヌケ, Aramenuke (Japan)

한볼락, Han Bollak (Korea)

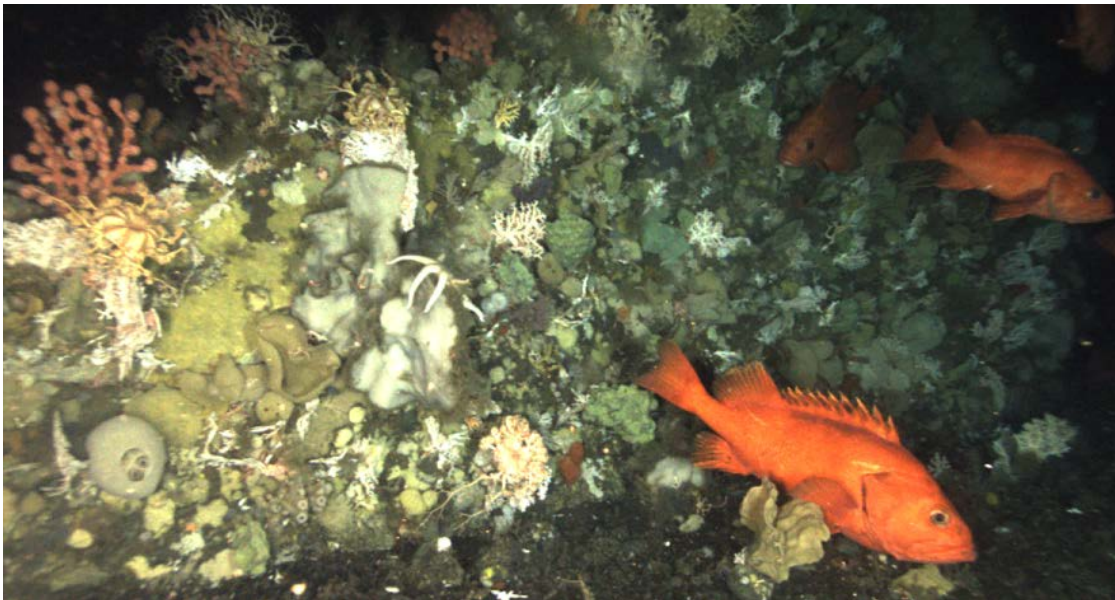


Figure 1. Blackspotted rockfish (*Sebastes melanostictus*).

Management

Active NPFC Management Measures

The following NPFC conservation and management measures (CMM) pertain to this species:

- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean
- CMM 2019-10 For Sablefish in the Northeastern Pacific Ocean

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Management Summary

Blackspotted and rougheye rockfishes are captured in the longline trap fishery that targets sablefish (*Anaplopoma fimbria*) at seamounts in the eastern part of the NPFC Convention Area. The current management measure for blackspotted and rougheye rockfishes specifies both catch and effort limits. The allowable catch of blackspotted and rougheye rockfishes in the eastern portion of the Convention Area is based on a long-term mean of historical catches from seamounts by Canada. It allows for 2.3 mt to be landed each month for the 6 months of the fishing season (April to September). The fishery is also managed through input controls by only allowing a single vessel to fish in each month. The 1-3 Canadian vessels licensed to fish in the NPFC Convention Area are submitted to the NPFC Secretariat annually.

Table 3: Current status of management measures

Convention or Management Principle	Status	Comment or Consideration
Biological reference point(s)	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Known	Allowable catch of 2.3 mt per month (6 month season)
Harvest control rule	Not accomplished	Not established
Other	Known	Effort control (single vessel per month)

Assessment

No stock assessment is conducted for blackspotted and rougheye rockfishes in the NPFC Convention area.

It is unclear if the blackspotted and rougheye rockfish population on seamounts in the NPFC Convention Area is distinct from the population on the continental shelf of Canada. There is evidence of population structure in other regions, such as Alaska, where population trends and genetics indicate some structure on the order of ~1000 km (Shotwell and Hanselman 2019, Gharrett et al. 2007, Shotwell et al. 2014). This is about twice the distance from the continental shelf to the fished seamounts in the NPFC Convention Area, however there is potentially a large barrier to dispersal of deepwater between the shelf and the seamounts. There is no available tagging data to indicate whether the blackspotted and rougheye rockfishes at seamounts are

connected to populations in domestic waters on the continental shelf. It is likely that the seamount populations are distinct stocks with distinct population trajectories.

Domestic stock assessments for blackspotted and rougheye rockfishes conducted in Canada assume there are two populations in domestic waters. These are assessed using a statistical catch at age model (DFO 2020). Assessments are also carried out in Alaska (Shotwell and Hanselman 2019, Spencer et al. 2018).

Data

Surveys

There is currently no survey conducted in the eastern NPFC Convention Area that captures or monitors blackspotted and rougheye rockfish populations.

Fishery

The Canadian high seas sablefish fishery typically operates at 1-4 seamounts in the commission area (Cobb, Eickleberg, Warwick and Brown Bear seamounts). Historically other seamounts have been fished for blackspotted and rougheye rockfishes both inside and outside Canada's EEZ.

Fishing is conducted with longlined traps. Since 2014 a maximum of 3 vessels per year have been allowed to fish in NPFC waters. Historically the number of fishing vessels has averaged <3 per year (since 2008). The number of fishing days is the number of unique calendar days during which gear was set. The number of fishing days has averaged from about 25 to greater than 100, but in most years has averaged between 50 and 75 (Figure 2).

No Canadian vessels have chosen to fish for Sablefish in the Convention Area since 2020. This is likely due to a combination of economics (high fuel prices and the large distance to the seamounts), the availability of quota in the domestic fishery which is easier to access and hesitancy about the requirements under the implementation of the new NPFC AIS policy.

Both Canada and the U.S.A. have domestic fisheries that target blackspotted and rougheye rockfishes inside their EEZ's. Blackspotted and rougheye rockfishes is also targeted in domestic trawl fisheries in Canada and the U.S.A.

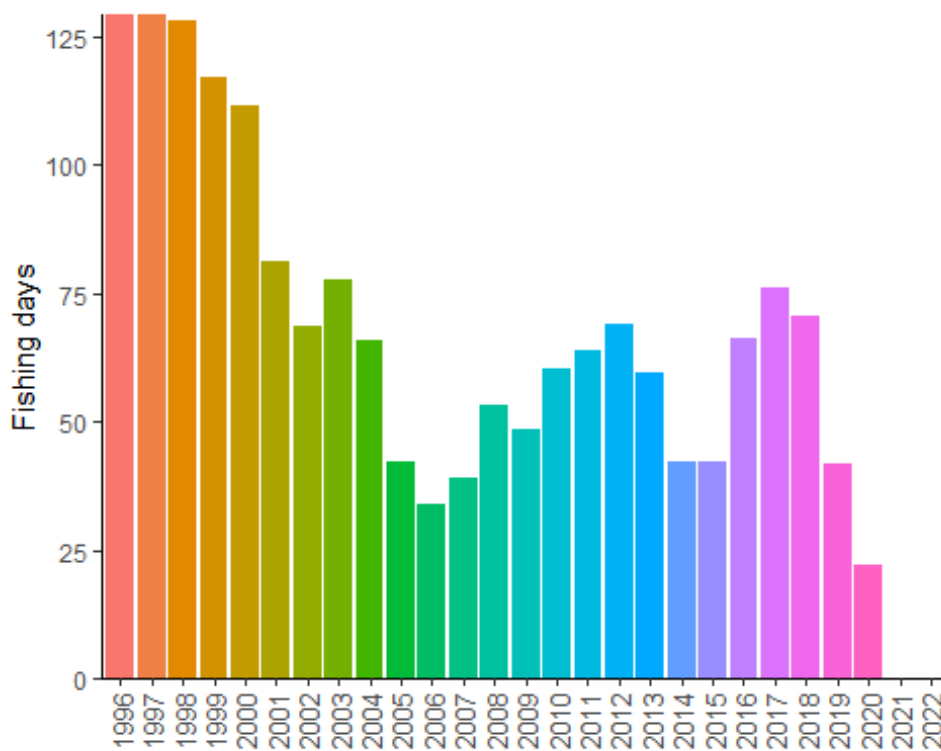


Figure 2. Fishing effort (in number of fishing days) for the Sablefish longline trap fishery conducted in NPFC waters (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

Output controls limit the landings of combined rougheye and blackspotted rockfish to 2.3 mt (in round weight). These measures have been in place since 2011.

Catches of blackspotted and rougheye rockfishes from NPFC region seamounts has ranged from an average of about 0.5 mt per year in 1996-2014 to about 4 mt in 2017 (Figure 3). Average annual catches were relatively low from 1996 to 2016 at NPFC seamounts and then increased in 2017-2018, with a decline to low levels in the last years. This increase in part probably reflects shifting sablefish effort due to closures of seamounts within Canada's EEZ. An examination of coastwide shifts in the spatial pattern of fishing effort showed that fishing effort has become concentrated on Cobb Seamount, with increasing effort in shallower waters perhaps reflecting increased targeting of blackspotted and rougheye rockfishes relative to the past (Figure 4).

There was no fishing effort at seamounts during 2021 or 2022 resulting in no catch.

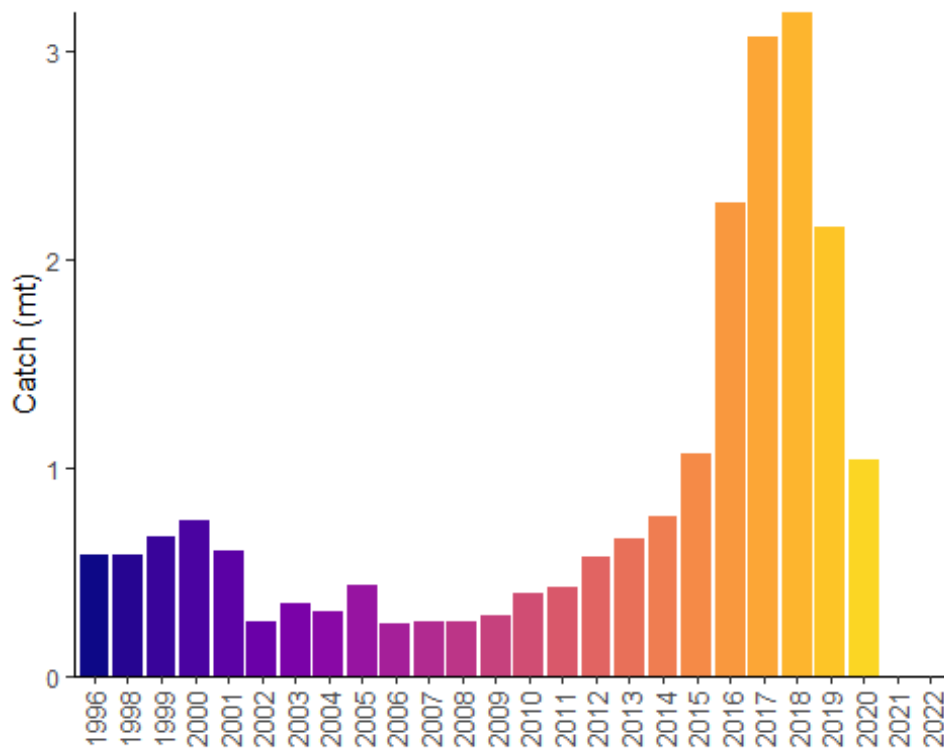


Figure 3. Landings of blackspotted and roughey rockfishes in the Canadian Sablefish fishery in NPFC region (1996-present). Data are averaged across 3 years to comply with data privacy restrictions.

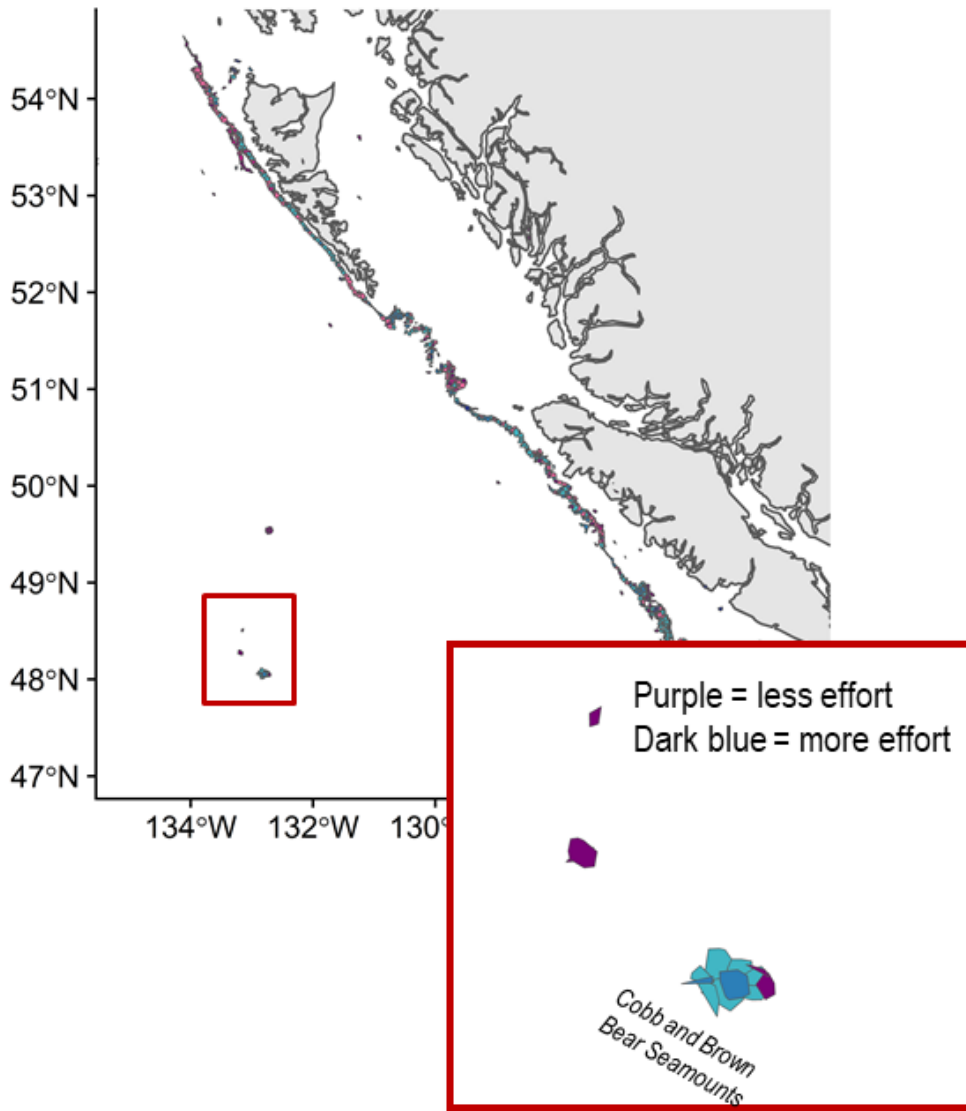


Figure 4. Relative change in spatial distribution of effort for Sablefish trap fishery from 2010-2017 to 2018-2019. Inset shows seamounts in the NPFC Convention Area.

Catch per unit of effort (mt/fishing days) for blackspotted and roughey rockfishes has been increasing over the last 10 years (Figure 5), averaging 0.01 mt/fishing day (CV = 108%). CPUE was not calculated in 2022 due to the absence of fishing in the Convention Area, but has generally been increasing since 2012.

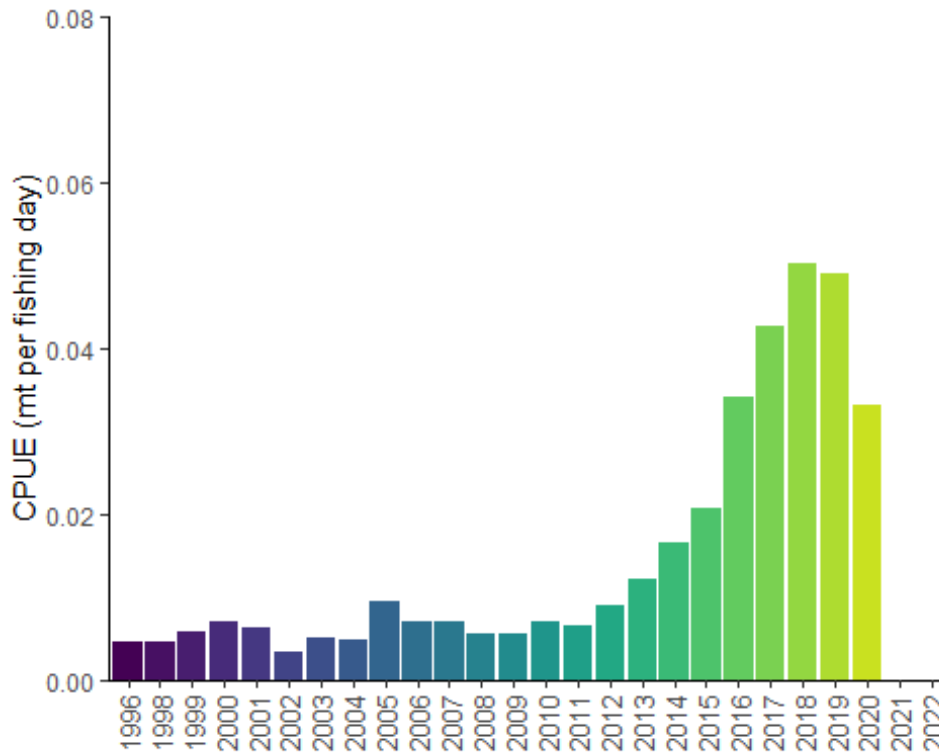


Figure 5. Catch per unit of effort for blackspotted and rougheye rockfishes in the Canadian Sablefish fishery in NPFC region. Data are averaged across 3 years to comply with data privacy restrictions.

Biological collections

No biological collections are taken from blackspotted and rougheye rockfishes captured in the NPFC Convention Area. Biological data are available from domestic fisheries and surveys in Canada.

Table 4: Data availability from Members regarding blackspotted and rougheye rockfishes

Data	Source	Years	Comment
Catch	Canada	1996-present	Catches from national waters and convention area
CPUE	Canada	1996-present	
Survey	None		Survey data are available from Canada and U.S.A. national waters

Data	Source	Years	Comment
Age data	None		Data available from Canada and U.S.A. domestic fisheries and surveys
Length data	None		Data available from Canada and U.S.A. domestic fisheries and surveys
Maturity/fecundity	None		Data available from Canada and U.S.A. domestic fisheries and surveys

Special Comments

None

Biological Information

Distribution

Blackspotted and rougheye rockfishes are widely distributed throughout the Pacific Ocean from California to the Gulf of Alaska, westward to the Aleutian, and northward into the Bering Sea (Figure 6; Love et al. 2002). They are also found along the western margin of the Pacific Ocean from the Kuril Islands through the Kamchatka Peninsula and northward into the Bering Sea. Adult blackspotted and rougheye rockfishes occur in rocky habitat along the continental slope, shelf gullies, and in deep fjords, generally at depths from 150 to 450 m (Love et al. 2002). Juvenile blackspotted and rougheye rockfishes are found at shallower depths (250-300 m) at the continental shelf break. Until recently, these species were considered a single species (rougheye rockfish; Orr and Hawkins 2008).

Life history

Blackspotted and rougheye rockfishes are extremely long-lived, with maximum ages > 200 years. They mature late at about 20 years of age. These characteristics make them vulnerable to overfishing. The species are live-bearing, extruding larvae generally in the spring (February-June). Blackspotted and rougheye rockfishes are benthic feeders, consuming mostly shrimps, crabs and fishes (Yang and Nelson 2000).

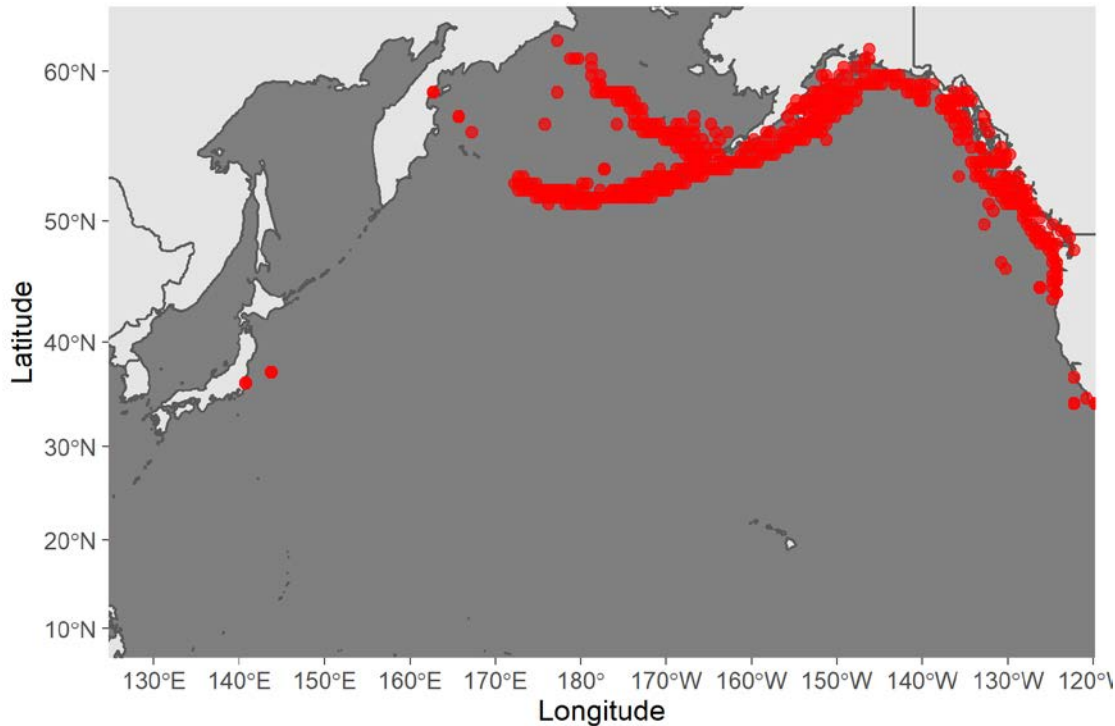


Figure 6. Map of distribution of blackspotted and rougheye rockfishes in the North Pacific.

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Species summary for neon flying squid

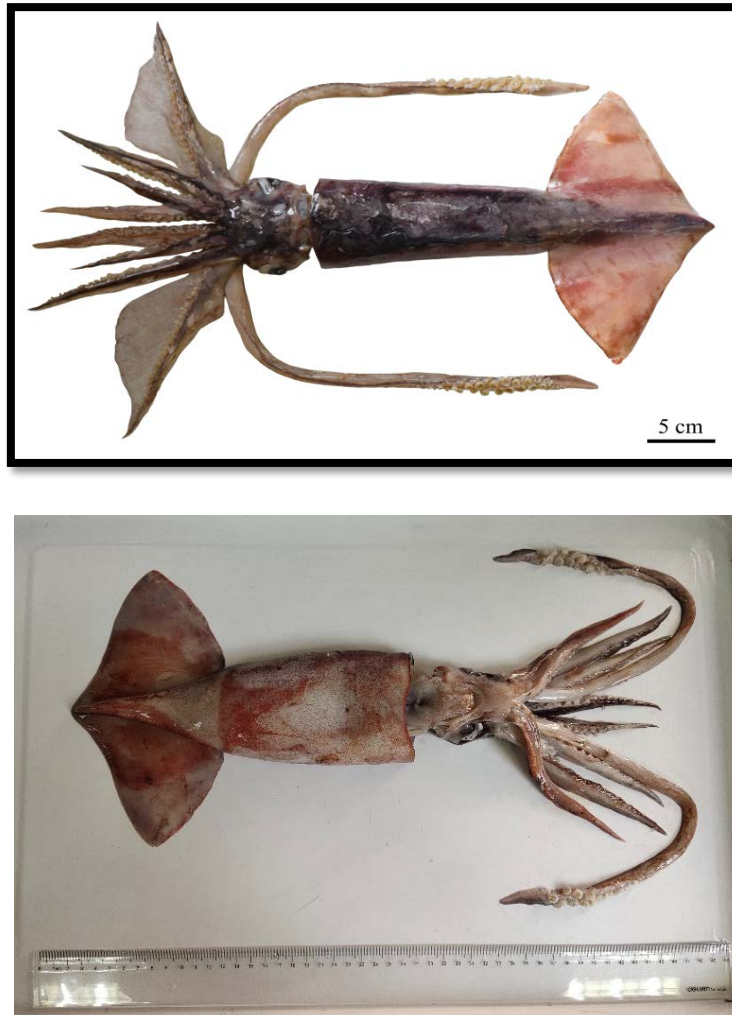


Figure 1. The pictures of neon flying squid

Neon Flying Squid (*Ommastrephes bartramii*)

Common names:

柔鱼 [rou yu] (Chinese); neon flying squid (English); アカイカ [akaika] (Japanese); 빨강오징어 (Korean); Кальмар Бартрама [kalmar bartrama] (Russian); 赤魷 [chi-you] (Chinese Taipei).

Other common names: Red flying squid; Webbed flying squid; Red ocean squid; Kalmar

(<https://www.sealifebase.ca/comnames/CommonNamesList.php?ID=58132&GenusName=Ommastrephes&SpeciesName=bartramii&StockCode=3971>)

Management

Active management measures






The following NPFC conservation and management measure (CMM) pertains to this species:
 CMM 2021-11 For Japanese Sardine, Neon Flying Squid and Japanese Flying Squid
 Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management summary

Does not specify catch limits.

Members of the Commission and CNCs with substantial harvest of neon flying squid in the Convention Area shall refrain from expansion of the number of fishing vessels authorized to fish such species from the historical existing level. Members of the Commission participating in fishing for the neon flying squid in areas under their jurisdiction adjacent to the Convention Area are requested to take compatible measures.

Table 1. Management Summary

Convention/Management		
Principle	Status	Comment/Consideration
Biological reference point(s)		Not established.
Stock status		Status determination criteria not established.
Catch or effort limits		Recommended catch, effort limits.
Harvest control rule		Not established.
Other		MSE...

 OK  Intermediate  Not accomplished  Unknown

Stock assessment

No unified stock assessment has been conducted by NPFC for the species.

Some members have conducted stock assessment or related studies for neon flying squid based on the information only from their own fisheries or surveys (Ichii et al. 2006; Chen, 2010; Cao et al. 2014).

Data

Survey

Japan conducted drift net survey in summer from 1999-2020 and jigging survey in winter from 2018~2020. Russia conducted upper epipelagic surveys from 1984-1992 and from 1999-2019 (see details in Table 2).

Fishery

Neon flying squid was harvested by China, Japan, Korea, Russia, Chinese Taipei and Vanuatu. Fishing methods included jigging, drift net, dip net and set net.

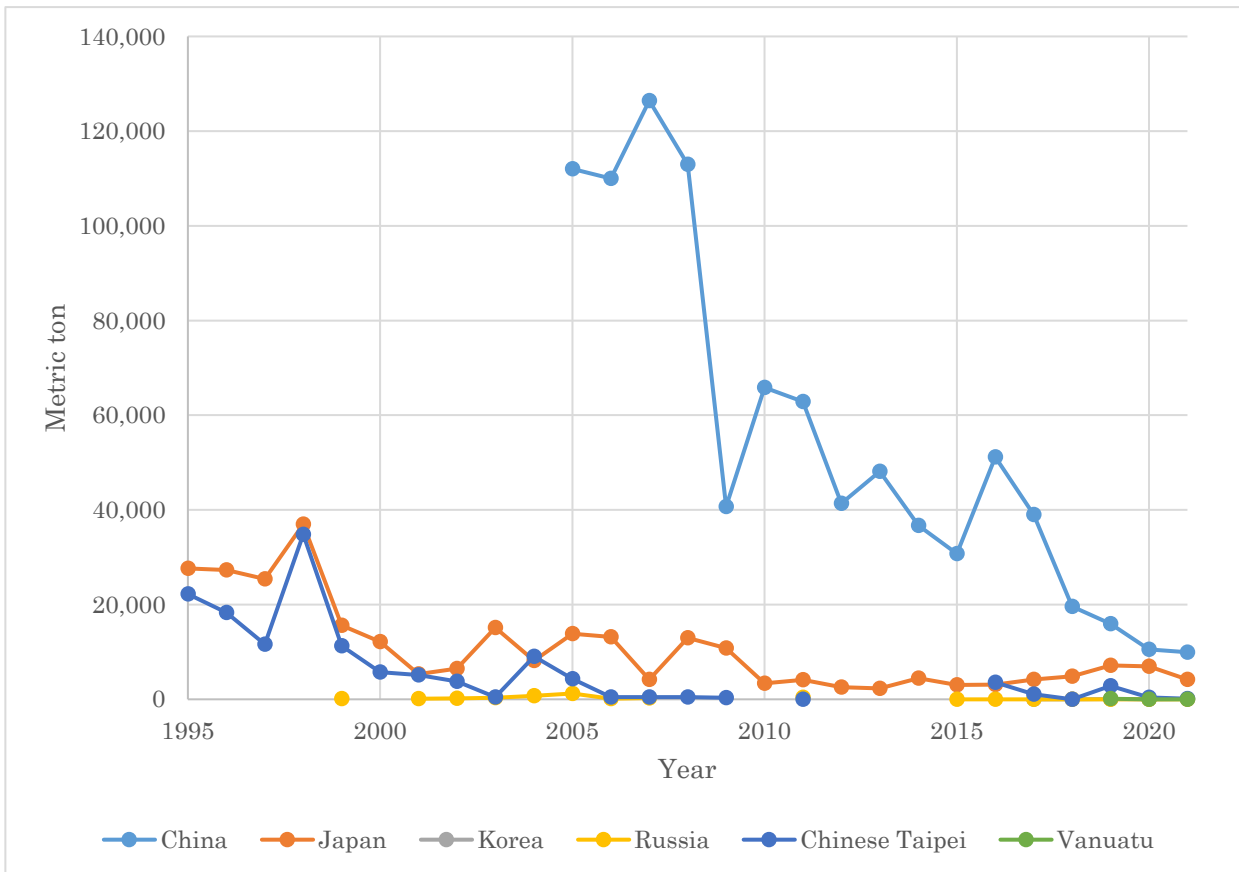


Figure 2. The historical catch of neon flying squid reported by members.

Data availability

Table 2. Data availability from Members regarding neon flying squid

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
CHINA				
Catch statistics				
Squid-jigging fisheries	Official statistics, reports from annual report	Official statistics: 2005-2019 Fishery data before 2005 (need to be confirmed)	Coverage = 100%	The neon flying squid catches are obtained from the fisheries logbook data provided by the fisheries

				company
Size composition data				
Length measurements	Sampling from commercial squid-jigging fishing vessels	2010-2016 Data before 2005 (need to be confirmed)	800-1000 fish/year	May lack representativeness
Aging	Sampling from commercial squid-jigging fishing vessels	2010-2016 Data before 2005 (need to be confirmed)	80-200 fish/year	May lack representativeness
Abundance indices (commercial)				
Squid-jigging fisheries	Squid-jigging logbook	1995-2019 Fishery data before 2005 (need to be confirmed)	Coverage=100%	Will conduct standardization

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
JAPAN				
Catch statistics				
Jigging fishery	Logbook	1995-2020	Coverage=100%	
Size composition data				
Length and weight measurements	Drift net survey (Summer)	1999-2020	500-600 squid/year	
	Jigging survey (Winter)	2018-2020	300-400 squid/year	

Abundance indices (survey)				
Summer survey on abundance of the autumn and winter-spring cohorts	Drift net survey CPUE for each cohort (individuals/panel)	1999-2020	20-30 stations/year	Small samples of male and matured female for the autumn cohort
Winter survey on abundance of the winter-spring cohort	Jigging survey CPUE (individuals/line)	2018-2020	12-16 stations/year	
Abundance indices (commercial)				
Jigging fishery	Logbook Standardized CPUE of the winter-spring cohort	1995-2020	Coverage=100%	Standardize CPUE for the autumn cohort

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
KOREA				
Catch statistics				
Jigging	Official statistics, reports from fisheries	2017 and 2019	Coverage =100%	
Size composition data				
Length measurements	Measured by observers while onboard	2017	3100 fish	Measurement details to be reviewed
Abundance indices (commercial)				
Jigging	Logbook data available	2017	60 set 2017	Data coverage details to be reviewed

Category and data sources	Description	Years with available data	Average sample size/year or data	Potential issues to be reviewed
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			coverage	
RUSSIA				
Catch statistics				
Drift net fishery	Official statistics, reports from fisheries associations	Official statistics: 1982-1990, 1999-2007, 2011 1985-1998, 2008-2010 and 2012-2020 (no data available); publications: 1972-2012	Coverage 1982-1984 ?%, 1999-2007, 2011 =100%	Data coverage details to be reviewed
Size composition data				
Length measurements	Sampling from commercial fishing vessels. Sampling during research surveys.	1999-2007, 2011 2012-2019	100-4,000 squids /year (ca. 50 measurements per sampling)	Data coverage details to be reviewed
Abundance indices (survey)				
Summer-autumn surveys to assess pelagic squids abundance	Upper epipelagic surveys	1984-1992, 1999-2019 (August-November)	60-80 stations/year 60-80 stations/year	Changes in abundance and migration patterns; development survey protocol and conduct standardization

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
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CHINESE TAIPEI				
Catch statistics				
Dip net fishery	Fishing gear used in different periods: 1977~1979: jigging 1980~1983: jigging and gillnet 1984~1992: gillnet 1993 till now: jigging	Data from 1977~1996 was provided by Taiwan Squid Fishery Association , data from 1997~2017 was based on logbook, and data from 2018~2020 was the statistics on landings.	Coverage 1977-1996 = ? % Coverage 1997-2017 = ? % Coverage 2017-2020 =100%	Only catch data is available before 1997.
Set net				

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
VANUATU				
Catch statistics				
squid jigging fishery	from logbook	2019	logbook from 2013 to now, coverage 100%	VU has authorized 4 vessels to conduct Pacific saury and squid jigging fishery in NPFC Convention Area. However, the vessel only targets neon flying squid by hand when they couldn't catch Pacific saury. Until now, we have only had squid catch information in 2019.

Biological Information

Distribution and migration

Neon flying squid is an oceanic squid distributed in temperate and subtropical waters of the Pacific, Indian and Atlantic Oceans. The North Pacific population occurs mainly between 20° and 50°N, and comprises two cohorts: a fall cohort with a hatching period from September to February and a winter–spring cohort with a hatching period mainly from January to May, but extending to August. Neon flying squid makes an annual round-trip migration between its subtropical spawning grounds and its northern feeding grounds near the Subarctic Boundary.

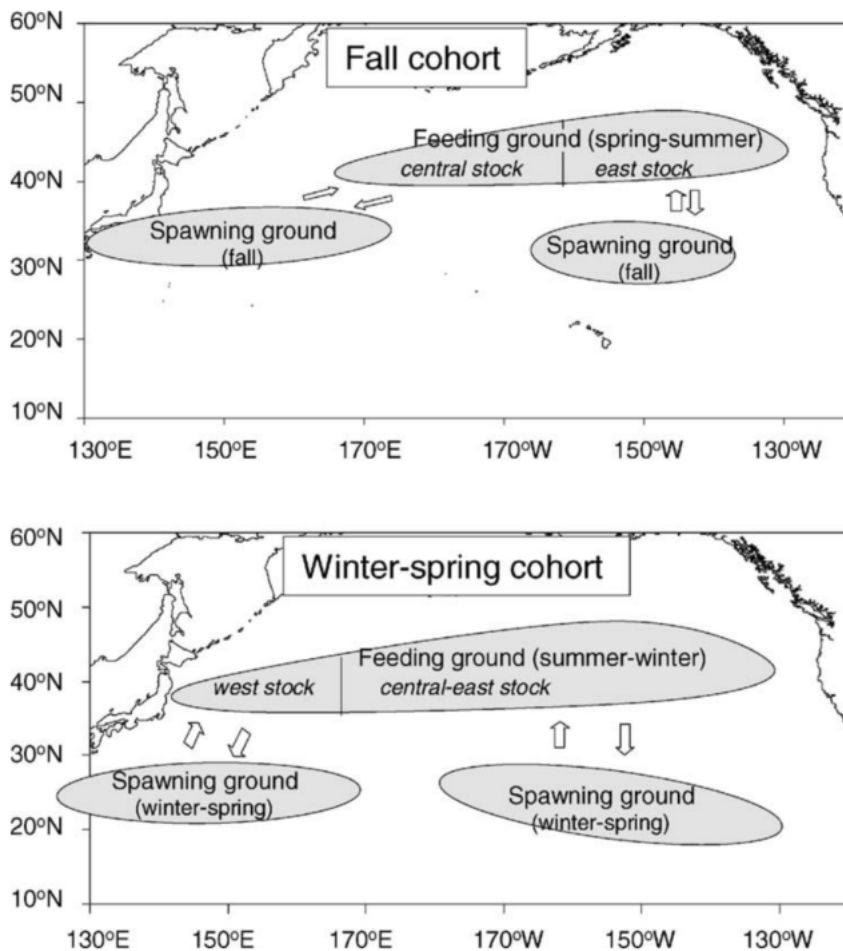


Figure 3. Migration patterns of the fall and winter–spring cohorts of neon flying squid in the North Pacific.

Life history

Growth is exponential during the first 30 days after hatching and then becomes more or less linear. It is suggested that this shift in growth accompanies a change in the feeding behavior that is thought to occur once the fused tentacles, which form a proboscis in the hatchlings, separate and become

functional.

Neon flying squid at 7-10 months of age and has an estimated 1-year life span. Size at maturity is about 30–33 cm ML in males and 40–55 cm ML in females. The maximum ML is around 45 cm in males and 60 cm in females.

During its northward migration and at the feeding grounds in the central North Pacific, neon flying squid feeds mainly on fishes, squids and crustaceans. Many marine mammals feed on neon flying squid. It is an important prey of northern fur seals in the central North Pacific, and a minor prey of short-beaked common dolphins (Bower and Ichii 2005).

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Species summary for Japanese sardine**Japanese sardine (*Sardinops melanostictus*)****Common names:**

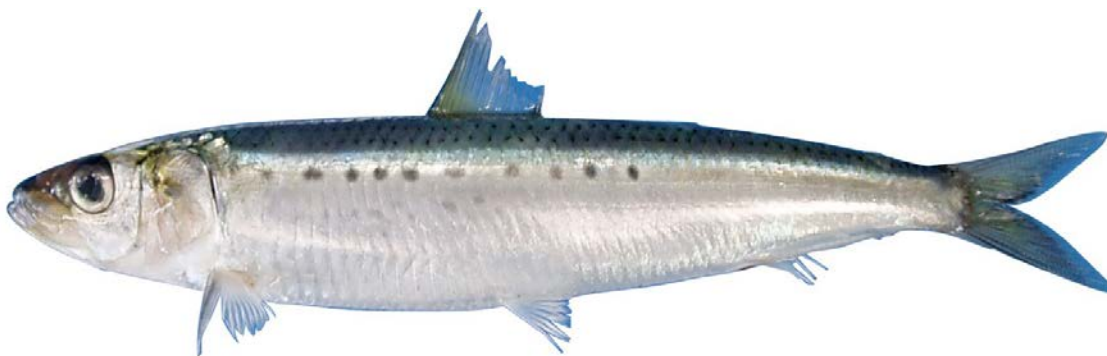
拟沙丁鱼, Ni Sha Ding Yu (China)

マイワシ, Maiwashi (Japan)

정어리, Jeong-eoli (Korea)

Дальневосточная сардина (Russia)

遠東擬沙丁魚, Yuan-Dong-Ni-Sha-Ding-Yu (Chinese Taipei)

**Management****Active NPFC Management Measures**

The following NPFC conservation and management measure (CMM) pertains to this species:

- CMM 2021-11 For Japanese Sardine, Neon Flying Squid and Japanese Flying Squid

Available from <https://www.npfc.int/active-conservation-and-management-measures>

Management Summary

The current management measure for Japanese Sardine does not specify catch or effort limits. The CMM states that Members and Cooperating non-Contracting Parties currently harvesting Japanese Sardine should refrain from expansion of the number of fishing vessels authorized to fish Japanese Sardine in the Convention Area. New harvest capacity should also be avoided until as stock assessment has been completed.

A stock assessment for Japanese Sardine is conducted by Japan within their EEZ and used for management of the domestic fishery.

Table 5: Current status of management measures

Convention or Management Principle	Status	Comment or Consideration
Biological reference point(s)	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	Recommended catch, effort limits
Harvest control rule	Not accomplished	Not established
Other	Intermediate	No expansion of fishing beyond established areas

Assessment

There is currently no stock assessment for Japanese Sardine conducted by NPFC for the Convention Area.

Japan conducts an assessment of the Japanese Sardine stock using VPA and a number of data sources described below (Hiroshi and Nishida 2005).

Data

Surveys

Japan conducts three surveys that estimate recruitment for a number of pelagic species, including Japanese Sardine (Table 2). The surveys target pre-recruits and juveniles to determine an index of recruitment. Japan also conducts a monthly egg and larval survey that is used to estimate spawning stock biomass. Surveys are conducted in spring (1995-2020), summer (2001-2020) and fall (2005-2020) at 30-80 stations per year. The survey protocol can be found at (Oozeki et al. 2007). Russia has conducted a summertime acoustic-trawl survey since 2010 that examines mid-water and upper epipelagic species including Japanese Sardine.

Fishery

China, Japan and Russia catch Japanese sardine. China does not target the species, but it is captured as bycatch in other fisheries (e.g. chub mackerel). Catches are primarily by purse seine, with a smaller component of the catch taken by pelagic trawl. China's catch of Japanese Sardine is taken exclusively from the Convention Area from April to December. China's existing catch records are from 2016 to 2020 and show increasing catches during that time period as the stock may have been increasing. The historical catches (prior to 2016) are unknown, thought to be low and likely need to be confirmed.

Japan's fishery for Japanese Sardine occurs inside their EEZ and is mostly conducted by large purse seine vessels (>90% of the catch). Additional components of the fishery include set nets, dip nets and other gears. The fishery experienced very high catches in the 1980's and early 1990's, a decline to very low catches from 1995 to ~2010 and has been recovering since then. The fishery is conducted year round, but mainly during the summer season.

The Russian fishery occurs inside their EEZ and is prosecuted primarily by pelagic trawling (>90% of the catch), with a smaller component of the catch coming from purse seines. The success of Russian fishery depends on the migration patterns and overall abundance of Japanese Sardine, as the sardine move into Russian waters when their abundance is high. For this reason, there was no catch from 1994-2011 when the stock abundance was low, but in recent years (since 2016) as the stock has recovered and water temperatures have been warm there have been increasing catches in Russia. The Russian fishery occurs primarily from June to November.

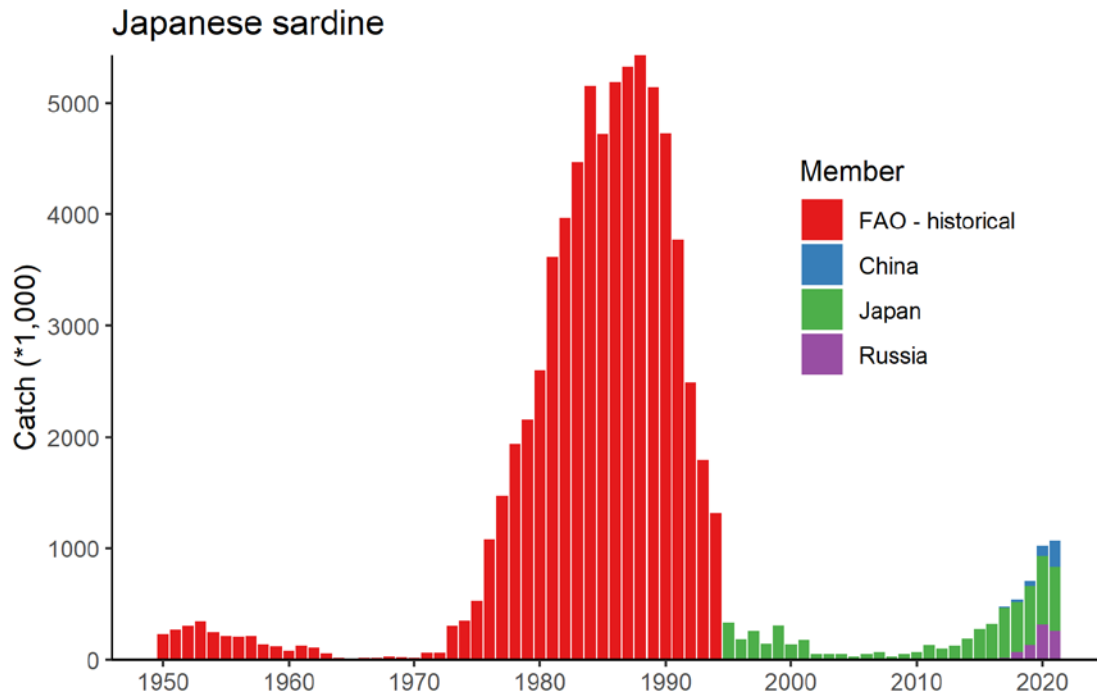


Figure 2. Historical catch of Japanese Sardine.

Other NPFC Members (Canada, Korea, Chinese Taipei, USA and Vanuatu) do not target Japanese Sardine. Chinese Taipei has some historical records of Japanese Sardine bycatch in the Pacific Saury fishery (~100 mt) and Korea has a small amount of historical bycatch data from the bottom trawl fishery. Vanuatu, USA and Canada have no record of Japanese Sardine catches.

Fishery catch data is available for Members from the NPFC website

(<https://www.npfc.int/system/files/2022-03/NPFC-2023-AR-Annual%20Summary%20Footprint%20-%20Japanese%20Sardine.xlsx>) since 2001. Prior years fishery catch data was downloaded from FAO data collections at <https://www.openfisheries.org> using rfisheries package (Karthik Ram, Carl Boettiger, and Dyck 2013).

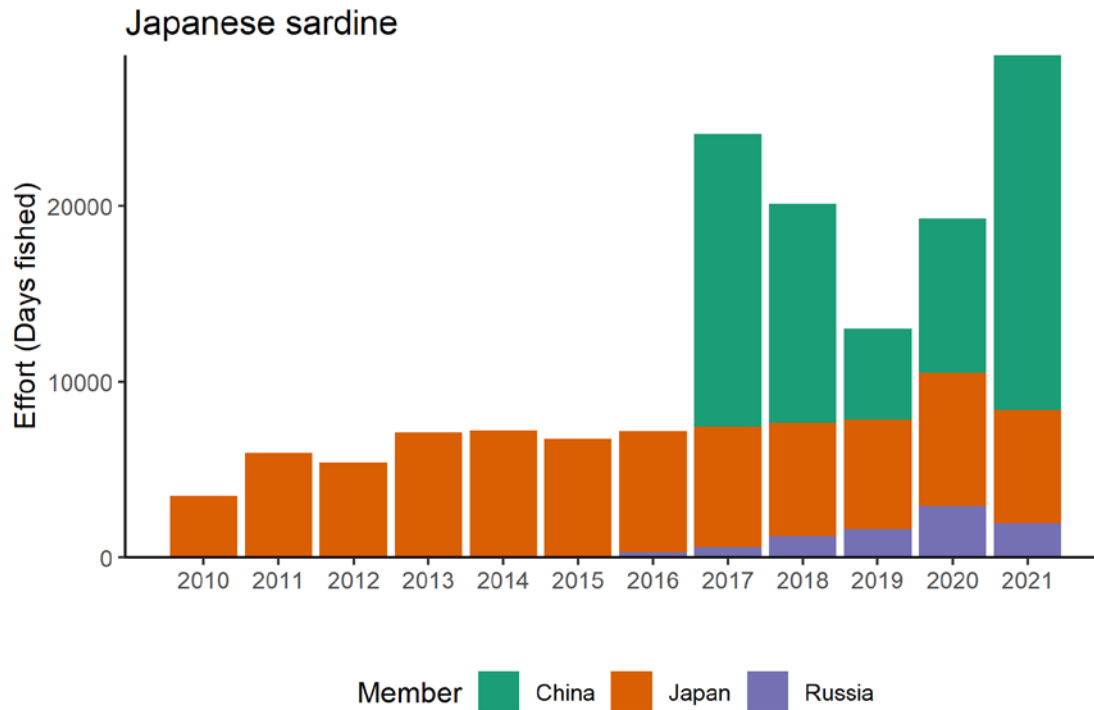


Figure 3. Historical fishing effort for Japanese Sardine.

Biological collections

China collected biological data from fishery catches of Japanese Sardine in 2020. These collections included length data as well as maturity and age structures.

Russia collects length and weight data, age structures (scales) and maturity data from both commercial catches and surveys.

Japan also collects length, weight, maturity and age data from the survey and fishery to support their stock assessment.

Table 6: Data availability from Members regarding Japanese sardine

Data	Source	Years	Comment
Catch	China	2016-present	Catches from convention area
	Japan	1995-present	Historical catch data from 1968 available, catches in national waters
	Korea		Minor bycatch in bottom trawl fishery

Data	Source	Years	Comment
	Russia	2016-present	Catches primarily in national waters, not convention area
	Chinese Taipei		Minor bycatch in Pacific saury fishery
CPUE			not developed
Survey	Japan		Pre-recruit survey
	Japan		Juvenile survey
	Japan		Monthly egg and larval survey
	Russia	2010-present	Acoustic-trawl survey
Age data	China	2020	Commercial catch
	Japan		Commercial and survey catches
	Russia		Commercial and survey catches
Length data	China	2020	Commercial catch
	Japan		Commercial and survey catches
	Russia		Commercial and survey catches
Maturity/fecundity	China	2020	Commercial catch
	Japan		Commercial and survey catches
	Russia		Commercial and survey catches

Special Comments

None

Biological Information

Distribution

Japanese sardine (*Sardinops melanostictus*; Figure 1) are a pelagic species that occurs in large migratory schools in the coastal waters of China, Chinese Taipei, Japan, Korea and Russia (Figure

4, (Kaschner et al. 2019)). They generally migrate from the south to the north during summer, returning to inshore areas in the south to spawn in the winter. Japanese sardine feed mainly on zooplankton and phytoplankton.

Life history

Japanese sardine are short-lived and fast growing, maturing early at 2-years old. Their maximum length is ~24 cm and their maximum reported age is 25 years (Whitehead 1985). Their growth rates and spawning patterns are highly influenced by the environment (Niino et al. 2021)

Taxonomically, the Japanese sardine are closely related to other species around the globe including *Sardinops* from southern Africa, Australia, South America and California.

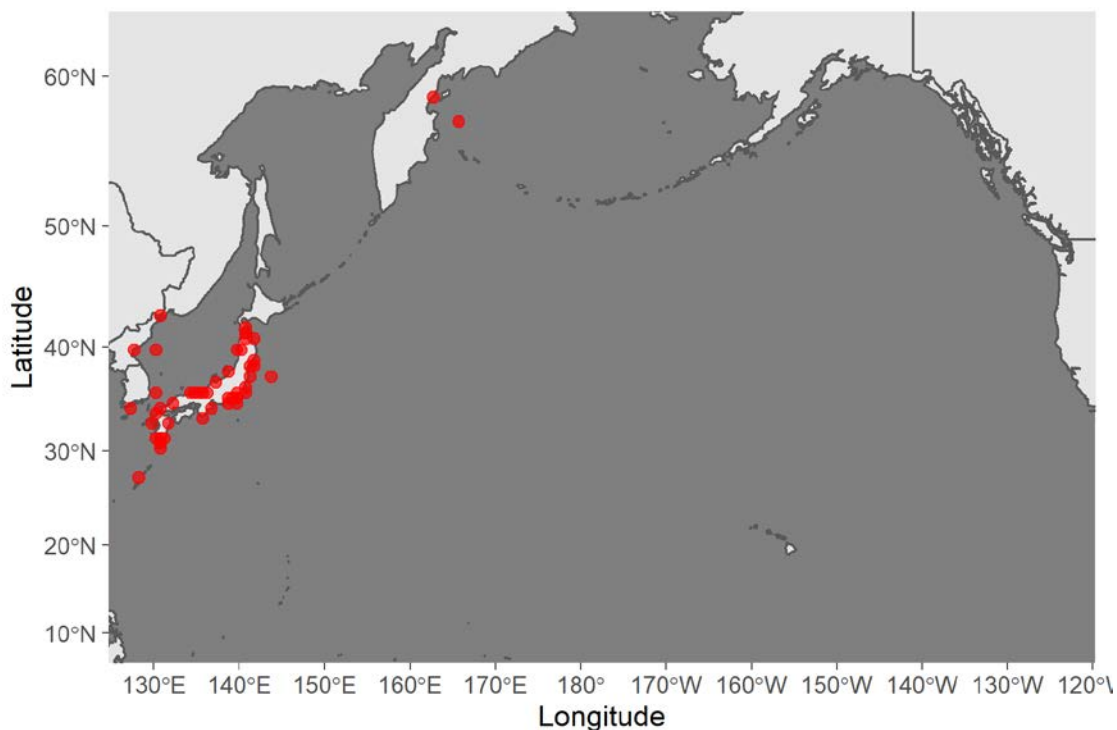


Figure 4. Map of distribution of Sardine species in the North Pacific.

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<https://doi.org/10.1111/fog.12542>.

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Whitehead, Peter J. P. 1985. “FAO Species Catalogue. Vol. 7. Clupeoid Fishes of the World (Suborder Clupeoidei). An Annotated and Illustrated Catalogue of the Herrings, Sardines, Pilchards, Sprats, Shads, Anchovies and Wolf-Herrings.” *FAO Fish. Synop.* 125(7/1): 1–303.

Appendix: Sardine and the environment

Table 7: Studies examining the relationship between Japanese sardine and the environment

Reference	Year	Type	Country	Ocean	Region	Species	Life stage	Parameter	Environmental variables	Effect	Method
Kodama, T, Wagawa T, Ohshimo S, Morimoto H, Iguchi N, Fukudome KI, Goto T, Takahashi T, Yasuda T. 2018. Improvement in Recruitment of Japanese Sardine with Delays of the Spring Phytoplankton Bloom in the Sea of Japan. Fisheries Oceanography 27 (4): 289–301. https://doi.org/10.1111/fog.12252 .	2018	journal paper	Japan	Pacific	Sea of Japan	Japanese sardine	Larvae	Recruitment	Sea surface chlorophyll a	delay in start and end dates of spring bloom were positively correlated with recruitment	Correlation, empirical orthogonal function
Yasuda, Tohya, Satoshi Kitajima, Akira Hayashi, Motomitsu Takahashi, and Masa aki Fukuwaka. 2021. “Cold Offshore Area Provides a Favorable Feeding Ground with Lipid-Rich Foods for Juvenile Japanese Sardine.” Fisheries Oceanography, no. January: 1–16. https://doi.org/10.1111/fog.12530 .	2021	journal paper	Japan	Pacific	Sea of Japan	Japanese sardine	juvenile	Body condition	Prey species and temperature	higher condition in offshore distributed fish due to lower temperature and higher lipid content prey	correlation
Nishikawa, Haruka. 2019. “Relationship between Recruitment of Japanese Sardine (Sardinops Melanostictus) and Environment of Larval Habitat in the Low-Stock Period (1995–2010).” Fisheries Oceanography 28 (2): 131–42. https://doi.org/10.1111/fog.12397 .	2019	journal paper	Japan	Pacific	Kuoshio current	Japanese sardine	Larvae	Recruitment	water temperature and larval drift	warmer temperature related to lower recruitment	correlation
Niino, Yohei, Sho Furuichi, Yasuhiro Kamimura, and Ryuji Yukami. 2021. “Spatiotemporal Spawning Patterns and Early Growth of Japanese Sardine in the Western North Pacific during the Recent Stock Increase.” Fisheries Oceanography, no. April: 1–10. https://doi.org/10.1111/fog.12542 .	2021	journal paper	Japan	Pacific	Kuoshio current	Japanese sardine	Larvae	growth	spawning distribution and timing (temperature)	early spawning in eastern area contributed to higher recruitment during time of increasing sardine biomass	correlation
Muko, Soyoka, Seiji Ohshimo, Hiroyuki Kurota, Tohya Yasuda, and Masa Aki Fukuwaka. 2018. “Long-Term Change in the Distribution of Japanese Sardine in the Sea of Japan during Population Fluctuations.” Marine Ecology Progress Series 593: 141–54. https://doi.org/10.3354/meps12491 .	2018	journal paper	Japan	Pacific	Sea of Japan	Japanese sardine	Adult	Distribution (SDM)	sea surface temperature	dome shaped relationship between sea surface temperature and the probability of presence, with peak between 10-20 C	generalized additive models

Annex I: SC07 Report

Reference	Year	Type	Country	Ocean	Region	Species	Life stage	Parameter	Environmental variables	Effect	Method
Sogawa, Sayaka, Kiyotaka Hidaka, Yasuhiro Kamimura, Masanori Takahashi, Hiroaki Saito, Yuji Okazaki, Yugo Shimizu, and Takashi Setou. 2019. "Environmental Characteristics of Spawning and Nursery Grounds of Japanese Sardine and Mackerels in the Kuroshio and Kuroshio Extension Area." <i>Fisheries Oceanography</i> 28 (4): 454–67. https://doi.org/10.1111/fog.12423 .	2019	journal paper	Japan	Pacific	Kuroshio current	Japanese sardine	Egg	Distribution	water temperature, larval drift, zooplankton	little variability in environment where eggs were found, copepod community structure was important	correlation
Kuroda, Hiroshi, Toshihiko Saito, Toshiki Kaga, Akinori Takasuka, Yasuhiro Kamimura, Sho Furuichi, and Takuya Nakanowatari. 2020. "Unconventional Sea Surface Temperature Regime Around Japan in the 2000s–2010s: Potential Influences on Major Fisheries Resources." <i>Frontiers in Marine Science</i> 7 (October): 1–21. https://doi.org/10.3389/fmars.2020.574904 .	2020	journal paper	Japan	Pacific	Pacific	Japanese sardine	Adult	Recruitment	PDO, SST	spawning was earlier during SST increases	correlation
Ma, Shuyang, Yongjun Tian, Caihong Fu, Haiqing Yu, Jianchao Li, Yang Liu, Jiahua Cheng, Rong Wan, and Yoshiro Watanabe. 2021. "Climate-Induced Nonlinearity in Pelagic Communities and Non-Stationary Relationships with Physical Drivers in the Kuroshio Ecosystem." <i>Fish and Fisheries</i> 22 (1): 1–17. https://doi.org/10.1111/faf.12502 .	2020	journal paper	China	Pacific	Kuroshio current	Japanese sardine	Adult	Abundance/Catch	Basin scale climate (ALPI, SST, Current patterns)	Climate variability introduced nonlinearity and nonstationarity to pelagic fish	time series analyses
Kurota, Hiroyuki, Cody S. Szuwalski, and Momoko Ichinokawa. 2020. "Drivers of Recruitment Dynamics in Japanese Major Fisheries Resources: Effects of Environmental Conditions and Spawner Abundance." <i>Fisheries Research</i> 221 (September 2019): 105353. https://doi.org/10.1016/j.fishres.2019.105353 .	2020	journal paper	Japan	Pacific	Pacific	Japanese sardine	Adult	Recruitment	"Environment" other than SSB	Regime shifts were detected in pelagic species	time series analyses, change point analysis
Furuichi, Sho, Tohya Yasuda, Hiroyuki Kurota, Mari Yoda, Kei Suzuki, Motomitsu Takahashi, and Masa Aki Fukuwaka. 2020. "Disentangling the Effects of Climate and Density-Dependent Factors on Spatiotemporal Dynamics of Japanese Sardine Spawning." <i>Marine Ecology Progress Series</i> 633: 157–68. https://doi.org/10.3354/meps13169 .	2020	journal paper	Japan	Pacific	Sea of Japan	Japanese sardine	Egg	Abundance and distribution	SST	Cold water led to decreased egg abundance over larger area, warm temperatures led to earlier spawning	correlation

Annex I: SC07 Report

Reference	Year	Type	Country	Ocean	Region	Species	Life stage	Parameter	Environmental variables	Effect	Method
Okazaki, Yuji, Kazuaki Tadokoro, Hiroshi Kubota, Yasuhiro Kamimura, and Kiyotaka Hidaka. 2019. "Dietary Overlap and Optimal Prey Environments of Larval and Juvenile Sardine and Anchovy in the Mixed Water Region of the Western North Pacific." <i>Marine Ecology Progress Series</i> 630: 149–60. https://doi.org/10.3354/meps13124 .	2019	journal paper	Japan	Pacific	Kuoshio current		larvae and juvenile	prey habits	SST	Temperature influences abundance of prey with effect on recruitment	correlation

Species summary for Japanese flying squid



Japanese Flying Squid (*Todarodes pacificus*)

Common names:

太平洋褶柔鱼 [tai ping yang zhe rou yu] (Chinese); Japanese flying squid (English); スルメイカ [surume-ika] (Japanese); 살오징어 [sal-o-jing-eo] (Korean); тихоокеанский кальмар [tihookeanskiy Kalmar] (Russian); 日本魷 [ri-ben-you] (Chinese Taipei).

Other common names: Japanese common squid, Pacific flying squid.

Management

Active NPFC Management Measures

The following NPFC conservation and management measure pertains to this species: CMM 2021-11 For Japanese Sardine, Neon Flying Squid and Japanese Flying Squid Available from <https://www.npfc.int/active-conservation-and-management-measures>.

Management Summary

The current management measure for Japanese flying squid (JFS) does not specify catch or effort limits. The CMM states that Members and Cooperating non-Contracting Parties currently harvesting JFS should refrain from expansion of the number of fishing vessels authorized to fish JFS in the Convention Area. New harvest capacity should also be avoided until a stock assessment has been completed.

Japan has been conducting stock assessment annually for two stocks of JFS such as the Autumn-

and Winter-spawning stocks since 1997. Japanese domestic total allowable catch (TAC) has been annually set for JFS based on acceptable biological catch (ABC) determined based on the stock assessment results.

Table 8. Management Summary

Convention/Management Principle	Status	Comment/Consideration
Biological reference point(s)	●	Not established.
Stock status	○	Status determination criteria not established.
Catch limit	●	Recommended catch, effort limits.
Harvest control rule	●	Not established.
Other	●	No expansion of fishing beyond established areas.

● OK ● Intermediate ● Not accomplished ○ Unknown

Stock Assessment

No stock assessment has been conducted by NPFC for the Convention Area.

Japan conducts annual stock assessments for JFS for the Autumn- and Winter-spawning stocks (Kaga et al. 2020, Kubota et al. 2020).

Data

Survey

JFS are encountered in several surveys conducted by Japan and Russia. Japanese surveys encounter multiple life history stages of one or more seasonal stocks, including larvae (winter survey), recruits (May-June), and adults. Russia conducts a survey of JFS during their feeding migration into Krill Islands waters, this results in number and biomass estimated by area swept method for Krill Islands waters (annual, for winter cohort only). While this survey captures only a portion of the stock so not fully representing stock biomass, it may help identify environmental impact on migration patterns, timing, etc.

Fishery

The winter-spawning stock of JFS is harvested in the NPFC Convention Area (see Biological Information).

JFS are caught by Members in both the Convention Area and National Waters. Catch tables are available at the NPFC website (<https://www.npfc.int/system/files/2021-07/NPFC-2021-AR-Annual%20Summary%20Footprint%20-%20Squids%20%28Rev.%20%29.xlsx>). Catches of JFS

in the Convention Area are low, as the majority of catches comes from Japanese and Russian national waters (Figure 1). JFS are caught using a variety of gears, most commonly squid jigging and trawl, but purse seine and set net are also used. They are predominantly caught as a targeted species, not as bycatch in other fisheries. However, in some seasons, they can be caught as bycatch in the Japanese sardine fishery. Chinese fishing fleets do not target JFS but encounter them in low quantities as bycatch in other fisheries.

There is no fishery CPUE index developed for this species in the Convention Area. Japan has already developed fishery-dependent/independent abundance indices to use in the domestic stock assessment.

Age data are collected by port samplers from a subset of Japanese fishing ports and for several Japanese prefectural research bodies. The squid’s statolith is used for counting daily ages and estimating hatching dates.

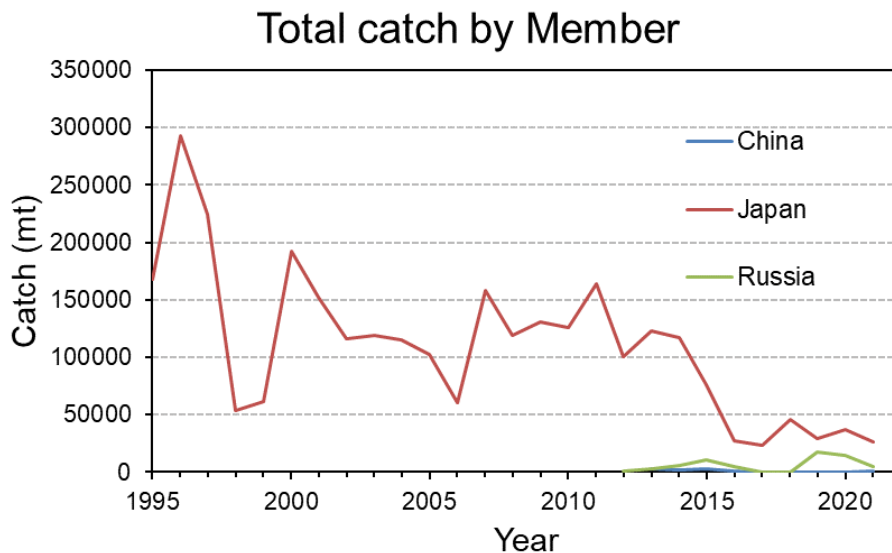


Figure 1. Total catch (mt) for each Member reporting Japanese flying squid catches during 1995-present.

Data table

Table 9. Data availability from Members regarding Japanese flying squid

Japanese flying squid: China*, Japan, Russia.

* No fishery targets Japanese flying squid. No relevant data.

Category and data sources	Description	Years with available data	Average sample size/ year or data coverage	Potential issues to be reviewed
JAPAN				

Catch statistics				
Coastal jigging fishery	Official statistics; Reports from fisheries associations and markets	1979-2021 (only after 1995 at some ports)	Coverage = 100%	
Offshore jigging fishery	Logbook	1979-2021	Coverage = 100%	
Trawl fishery	Logbook	1980-2021	Coverage = 100%	
Purse seine fishery	Official statistics; Reports from fisheries associations and markets (only at Hachinohe and Mie);	1995-2021	Coverage = 100%	
Set net	Official statistics; Reports from fisheries association	1995-2021	Coverage = 100%	
Size composition data				
Length measurements	Port sampling by eight local fisheries research bodies at major ports on the Pacific side	1979-2021	3000-15000 fish/year (about 50 individuals measured per a single size sampling)	Data coverage in the eastern Hokkaido (Nemuro Strait)
Aging	Port sampling by three local fisheries associations and nine fisheries research bodies	2012-2021	700-1400 fish/year	Data coverage in the eastern Hokkaido (Nemuro Strait)
Abundance indices (survey)				
Winter survey for larvae	BONGO net	2001-2021	65-204 stations/year	Review survey protocol and conduct standardization

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Survey for recruitment from May to June	Midwater trawl	1996-2021	24-63 stations/year	Review survey protocol and conduct standardization
Survey for recruitment in June	Jigging	1972-2021	25-83 stations/year	Review survey protocol and conduct standardization
Survey for recruitment from June to July	Midwater trawl mainly targeting saury	2001-2021	33-136 stations/year	Review survey protocol and conduct standardization
Survey for recruitment in July	Midwater trawl	2018-2021	28-39 stations/year	Short time series (three years)
Survey for recruitment in August	Jigging	1979-2021	28-66 stations/year	Review survey protocol and conduct standardization

Abundance indices (commercial)

Coastal jigging fishery	Monthly catch and effort data reported by fisheries associations and markets in the seven major regions during fishing season from July to December; Standardized CPUE for domestic stock assessment	1979-2021	25-37 observations/year	
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Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
RUSSIA				

Catch statistics				
Jigging fishery	Official statistics, reports from fisheries associations	Official statistics: 1964-1970, 2013-2020, 1971-2012 (no data available); publications: 1967-2018	Coverage 1964-1970 ?%; Coverage 2013-2020 =100%	Data coverage details to be reviewed
Midwater trawl fishery				
Size composition data				
Length measurements	Sampling from commercial fishing vessels. Sampling during research surveys.	1966-1975 1992-2020	500-3,000 squids /year (ca. 50 measurements per sampling)	Data coverage details to be reviewed
Aging	-	-	-	-
Catch at age (CAA)	-	-	-	-
Abundance indices (survey)				
Summer trawl and acoustic (echointegration) surveys to assess pelagic squids abundance	Mid-water upper epipelagic surveys	1992-2020 (June-July) 1992-2020 (July-August)	60-80 stations/year 60-80 stations/year	Changes in abundance and migration patterns; development survey protocol and conduct standardization

Biological Information

Distribution and migration

JFS are distributed mainly in the northwest Pacific (Figs 2 and 3) and their northward/southward shifts in distribution range occur in response to changes in water temperature (Sakurai et al. 2013). JFS extent their distribution up to 50° N in September. There are northmost (eastmost) and southmost occurrences recorded in Canada and Hong Kong, respectively (Cuttlefishes and Squids of the World, FAO.org).

The autumn- and winter-spawning stocks have spatially different nursery areas and migration

patterns (Fig 3). Although the nursery area of the autumn-spawning stock is located in the Sea of Japan, the winter-spawning stock has the nursery area east of Hokkaido and Tohoku regions of Japan, of which a part overlaps the NPFC Convention Area. Both stocks conduct southward migration via the Sea of Japan towards each spawning grounds.

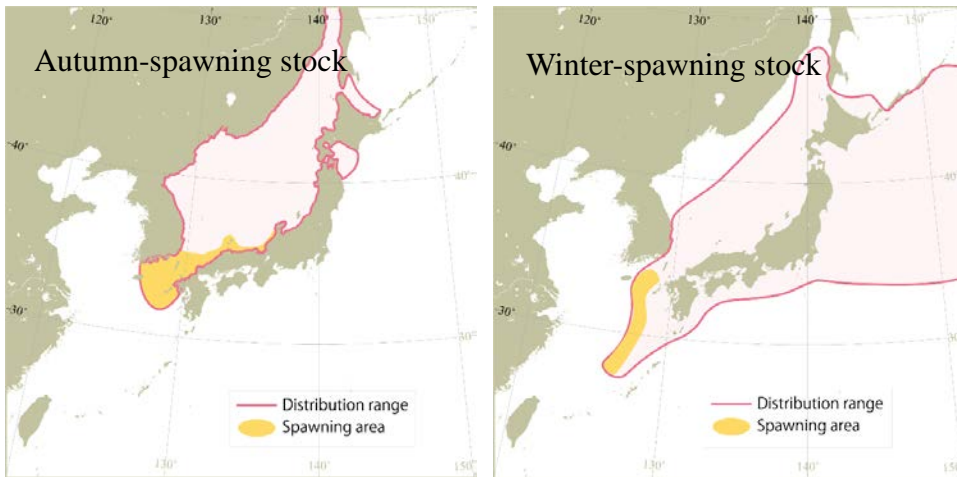


Figure 2. Distribution ranges and spawning areas of autumn- and winter-spawning stocks. These figures were modified based on Kubota et al. (2020) and Kaga et al. (2020).

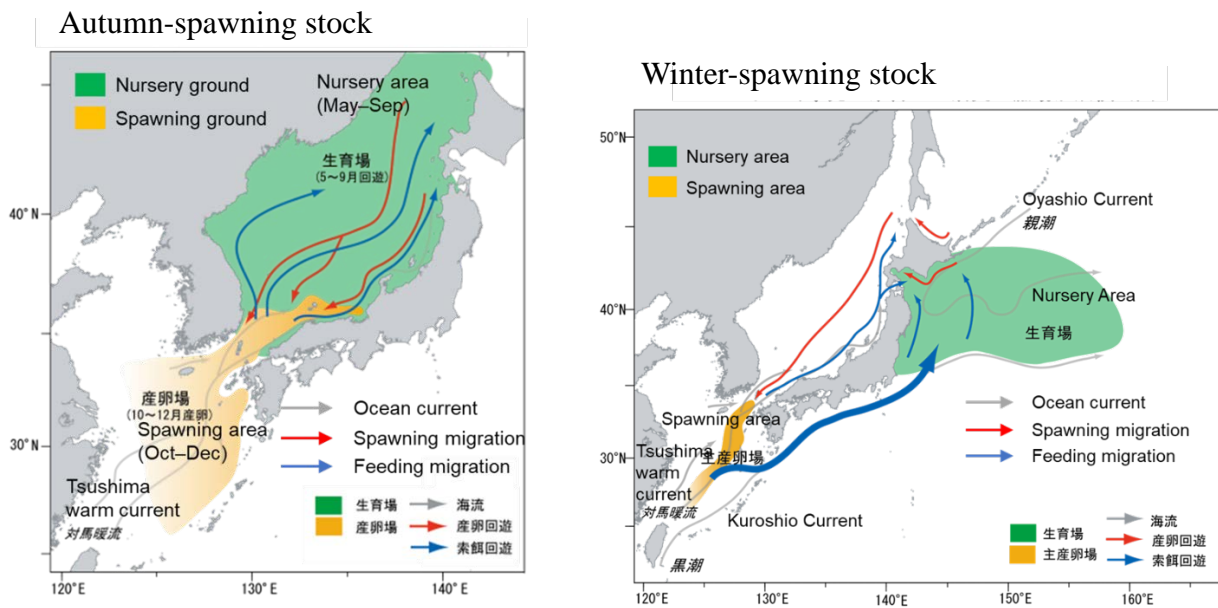


Figure 3. Seasonal migration of autumn- and winter-spawning stocks. These figures were modified based on Kubota et al. (2019) and Okamoto et al. (2021).

Stock Structure

There are distinct sub-populations (stocks) which spawn during different seasons (FAO.org, Sakurai et al. 2013). An autumn-spawning stock is most abundance, followed by a winter-spawning stock which is distributed in the waters off eastern Japan Oyashio region (Sakurai et al. 2013, Kaga et al. 2020, Kubota et al. 2020). There is, in addition, minor stock of spring/summer spawned squid.

Life history

Maximum size thought to be 50 cm (mantle length) for females, smaller for males. Females are thought to mature around 20-25 cm (mantle length). The JFS lifespan is approximately one year (FAO.org). According to FAO, JFS prey on myctophids, anchovies, crustaceans, gastropod larvae, and chaetognaths, and are preyed upon by rays and several marine mammals.

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FAO.org <http://www.fao.org/fishery/species/3567/en>

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Kubota, H., Miyahara, H., Kaga, T., Okamoto, S., Nishijima, S., Matsukura, R., Matsui, H., Abo, J., Takasaki, K., Saito, T and Inagake, D. (2021) Stock assessment and evaluation for autumn-spawning stock of Japanese flying squid (fiscal year 2021). In Marine Fisheries Stock Assessment and Evaluation for Japanese Waters (fiscal year 2021/2022). Fisheries Agency and Fisheries Research and Education Agency of Japan. <http://abchan.fra.go.jp/digests2021/details/202119.pdf> (in Japanese)

Sakurai, Y., Kidokoro, H., Yamashita, N., Yamamoto, J., Uchikawa, K., & Takahara, H. (2013). *Todarodes pacificus*, Japanese common squid. Advances in Squid Biology, Ecology and Fisheries. Part II Oegopsid Squids. Nova Biomedical, New York, 249-272.

Species summary for blue mackerel

**Blue mackerel (*Scomber australasicus*)**

澳洲鲈 [ao-zhou-tai] (Chinese), ゴマサバ [gomasaba] (Japanese), 망치고등어 [Mang-chi-go-deung-eo] (Korean), пятнистая скумбрия [pyatnistaya skumbriya] (Russian), 花腹鯖 [Hua-Fu-Ching] (Chinese Taipei)

Other common names: Spotted mackerel

Management**Active NPFC Management Measures**

None

Management Summary

- ✓ Conservation and Management Measure has not been set for blue mackerel in the NPFC.
- ✓ In Japan, total allowable catch (TAC) has been introduced to management of mackerels (blue mackerel and chub mackerel) since 1997.

Convention/Management Principle	Status	Comment/Consideration
Biological reference point(s)	●	Not established.
Stock status	○	Status determination criteria not established.
Catch limit	●	Recommended catch, effort limits.
Harvest control rule	●	Not established.
Other	●	No expansion of fishing beyond established areas.

● OK

● Intermediate

● Not accomplished

○ Unknown

Stock Assessment

- ✓ No stock assessment has been conducted by NPFC.
- ✓ Japan conducts stock assessments on the Pacific stock and the East China Sea stock of blue mackerel using VPA (Yukami et al. 2019a, Hayashi et al. 2019). Only the Pacific stock is distributed in the NPFC convention area.

Data

Survey

Japan conducts three surveys: (1) egg and larval distribution survey (every month, Figs. 1, 2), (2) juvenile survey (May-Jul from 2001), and (3) pre-recruit fish survey (Aug-Oct from 2001). Other members do not conduct any survey on blue mackerel.

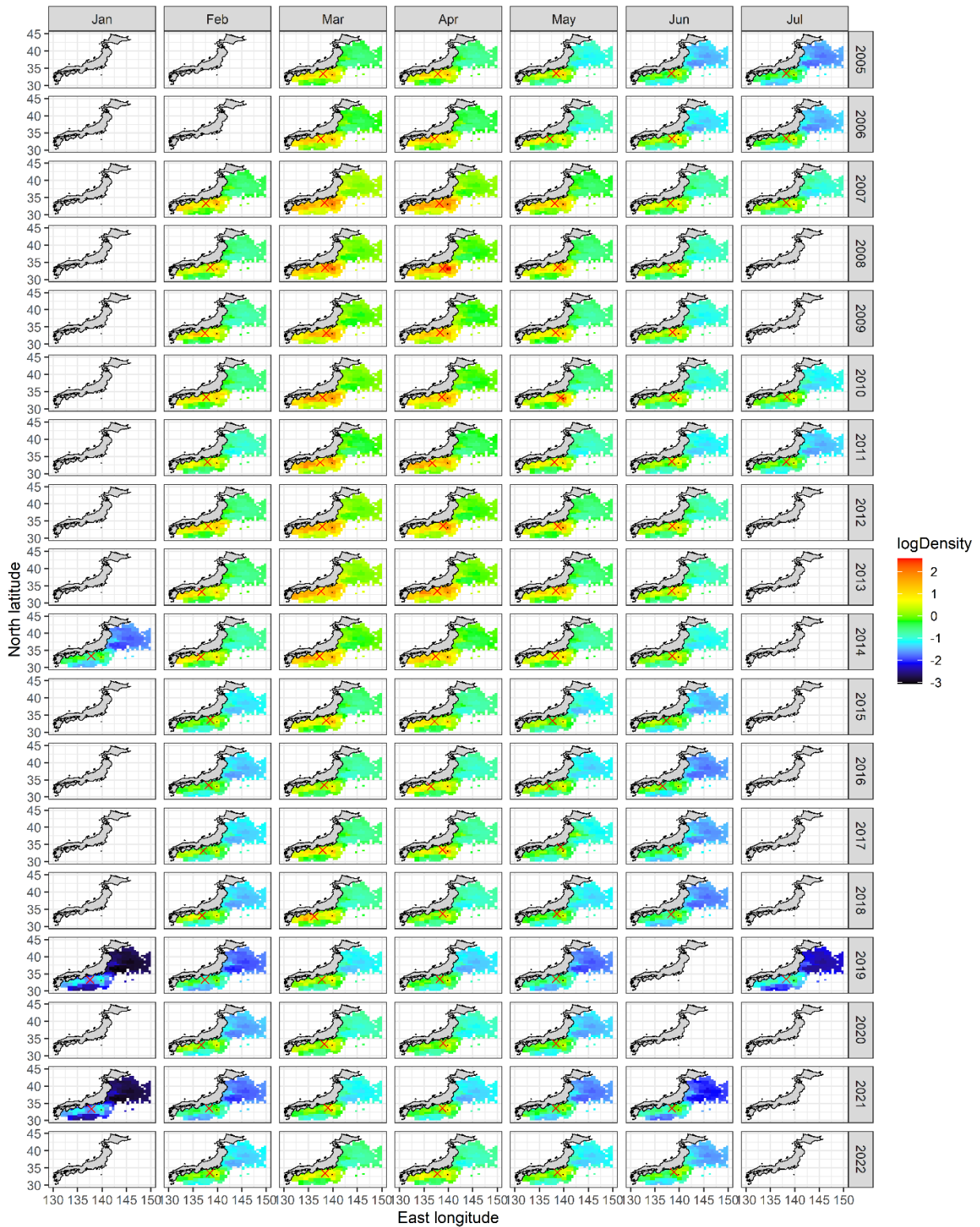


Figure 1: Spatial distributions of blue mackerel eggs on the Pacific coast of Japan by month (column) by year (row), estimated from the seasonal VAST model (Thorson et al. 2020) with the egg survey data. The sign of X in red represents the center of gravity.

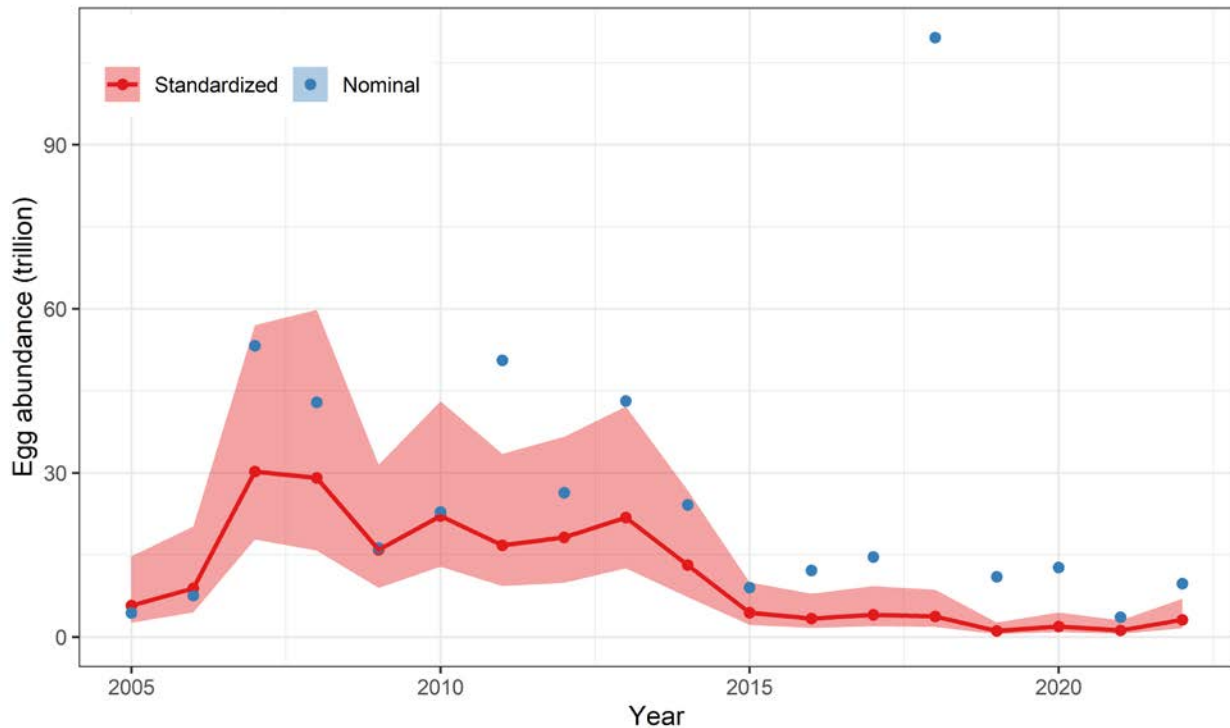


Figure 2: Time series of egg abundance indices. Nominal index and standardized index are shown. This standardization incorporates the effect of species misidentification of chub mackerel as blue mackerel, which is a reason why standardized values are lower than nominal values in most years typically 2018. See Kanamori et al. (2021) for details.

Fishery

The fishing grounds of Japanese fisheries are located in the water on continental shelves and slopes, around water of Islands within Japan's EEZ. The primary fishing gears of Japan are purse-seine (large-scale >40GRT and small-scale <40GRT vessels), set net and dip net. In the 1980s, blue mackerel were caught mostly by dip net. From the 1990s, large- and small-scale purse-seine fisheries dominated the catch. The blue mackerel catch has decreased since 2010s and remains at low levels in recent years (Fig. 3). Chub and blue mackerels are caught together by the fisheries and summed together as "mackerels" in fishery statistics of Japan. The blue mackerel catch was estimated from the mixing ratio survey of landing. Japan conducts the identification of each species by external form; blue mackerel has clear black spots on both sides of body, and the interval between splines of first dorsal fin of blue mackerel is narrower than that of chub mackerel. The proportion of blue mackerel catch in the total mackerel catch was around 10% from 2016 to 2020.

China operates a blue mackerel fishery in the NPFC Convention Area only, on the same fishing grounds as for chub mackerel. The portion of blue mackerel is about 10% of the mackerel catch, although it varies from year to year. China takes samples to determine the composition of mackerel species in the catch and collects biological information.

In Russia, there are no accurate catch statistics on the proportion of blue and chub mackerels.

However, the portion of blue mackerel is very small and probably comprises less than 1% of the total mackerel catch by Russia.

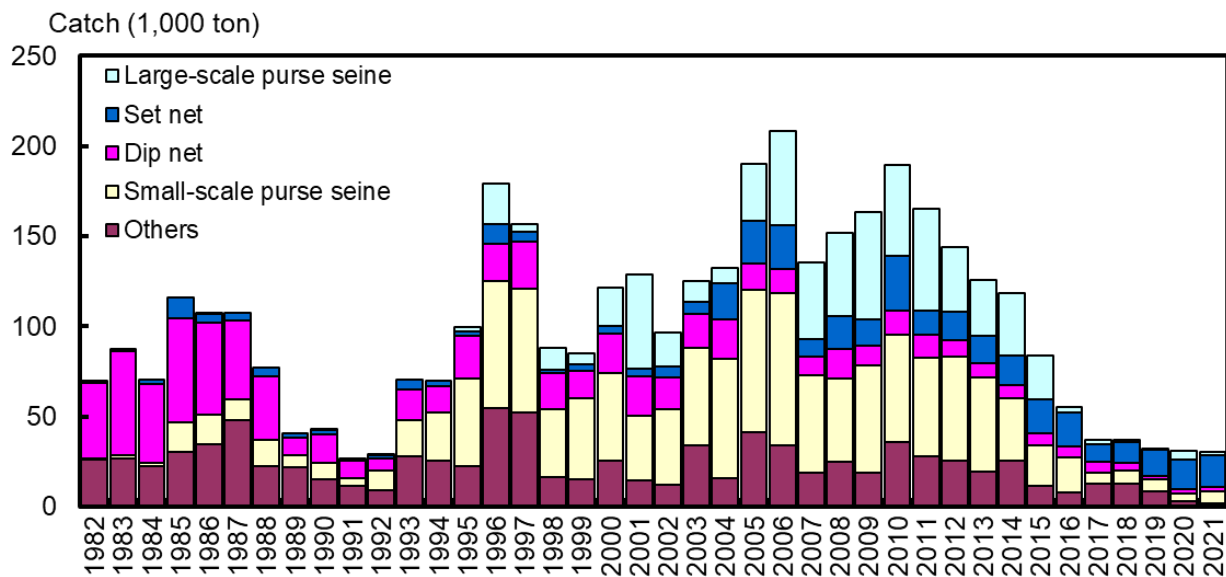


Figure 3: Catch weight by fishery from 1982 to 2021 in Japan.

Data table

Data availability tables which include information about catch, abundance indices and biological data from China and Japan are respectively shown below (Tables 1, 2). For Russia, no relevant data are available.

Table 1: Data availability table from China.

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
CHINA				
Catch statistics				
Purse seine fishery Trawl fishery	Official statistics, reports from annual report	Official statistics: 2015-2022	Coverage=100 %	The blue mackerel and Japanese sardine catches are from the fishing catch provided by the fishery company
Size composition data				

Length measurements	Port sampling by Institute and technology group.	2018-2022	550-800 fish/year	Details to be reviewed
Aging	Sampling during research surveys and from commercial fishing vessels	2020-2022	30-180 fish/year	Details to be reviewed
Catch at age (CAA)	Estimate CAA from the above data	2020-2022	Age-length keys are to be developed	Evaluate uncertainty of catch at age, especially on changes of growth depending on recruitment abundance
...				
Abundance indices (survey)				
Abundance indices (commercial)				
Purse seine fishery	Purse seine logbook	2015-2022	10-60/year	Should separate blue mackerel and chub mackerel Will conduct standardization

Table 2: Data availability table from Japan.

Category and data sources	Description	Years with available data	Average sample size/year or data coverage	Potential issues to be reviewed
JAPAN				
Catch statistics				

Purse seine fishery	Official statistics; reports from fisheries associations and markets	Official statistics: 1950-2021, other reports: 1982-2021	Coverage=100 %	The spotted mackerel catches are estimated from chub and spotted mackerel catches based on port sampling data
Dip net fishery				
Set net				
Size composition data				
Length measurements	Port sampling by 17 local fishery institutes in 17 prefectures	1995-2021	4,000-40,000 (average 10,000) fish/year (ca. 100 measurements per sampling)	Data coverage review
Aging	Port sampling by 17 local fishery institutes in 17 prefectures	1995-2021	500-1000 fish/year	Data coverage review
Catch at age (CAA)	CAA is estimated with length measurement and aging data	1995-2021	Age-length keys are created approximately by quarter and local regions	Evaluation of uncertainty in catch at age, especially on changes in growth depending on recruitment abundance
Abundance indices (survey)				
Year-round for egg density	Almost all local fisheries research bodies join this survey program. NORPAC net is sampling gear. This survey is conducted for small pelagic species.	2005-2022	ca. 6000 stations in total, 1000-4000 stations with spotted mackerel eggs/year	Review survey protocol and conduct standardization
Abundance indices (commercial)				

Dip net fishery	Logbook data are collected from fishermen in Shizuoka prefecture since 1995	1995-2022	100-500/year	Standardization
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Special Comments

Although the Small Working Group (SWG) used ‘spotted mackerel’ as the common name of this species, the SWG recommended to SC to change the common name to ‘blue mackerel’ for consistency with the FAO database of fish species.

Catch statistics specific to blue mackerel in the NPFC Convention Area are not available because combined catch of chub and blue mackerels have been reported to NPFC (<https://www.npfc.int/summary-footprint-chub-mackerel-fisheries>). Separation of chub and blue mackerels in catch data including historical data will be necessary for a stock assessment by NPFC.

Biological Information

The below descriptions are mostly extracted from Yukami et al. (2019b).

Distribution and migration

Blue mackerel is distributed from Japan to Australia and New Zealand in the Indo-West Pacific (Froese and Pauly 2022). Blue mackerel around Japan is divided into two stocks by spatial distributions in Japanese stock assessments: Pacific stock and East China Sea stock (Hayashi et al. 2019, Yukami et al. 2019; Fig. 4). Below we describe biological information based on the Pacific stock of blue mackerel, mostly extracted from Yukami et al. (2019b).

Blue mackerel tends to distribute in warm offshore waters. The main distribution area for adults is around water of the Kuroshio current. The larvae hatch around the Kuroshio current and are distributed from the coastal water of southern Honsyu to the transition water between Kuroshio and Oyashio currents located 165 to 170 East longitude, the same as the chub mackerel larvae. The juveniles sized at 5 to 15cm fork length (FL) transferred to transition water, migrate to north as they grow, feed at the area from coastal water of eastern Hokkaido and Kurill Islands to the subarctic water around 165 degree East longitude where the surface temperature around 13°C in summer to fall. They reach 20 to 25cm FL in fall to winter, and migrate south to the coastal waters of Joban and Boso to offshore water around Kuroshio current for wintering. A wintering ground in the water near Emperor Seamounts was observed for 2004 year class which had high recruitment. Age 1 fish did not appear in the water north of Sanriku district after wintering until 1980, but they have migrated to the water from Tohoku to Hokkaido with the increase of surface temperature since 2001. They return south for wintering and migrate to the Izu Islands water for spawning in spring. Many schools distribute near Kuroshio current at the coastal water of southern Honshu all the year and are targeted by many fisheries. These are different from the schools that largely migrate from near

the Kuroshio current at the Izu Island to Tohoku and Hokkaido waters. It is suggested that many fish above age 3 do not migrate north of Sanriku district and stay at the western water near the cape Ashizuri with small migrations or stay near the spawning grounds. Furthermore, it is considered that the observation of schools mainly consisting of age 8 fish at the Emperor seamounts area in 2008 to 2015 were due to the dominant recruitment spawned at the water south of Hachijo Island.

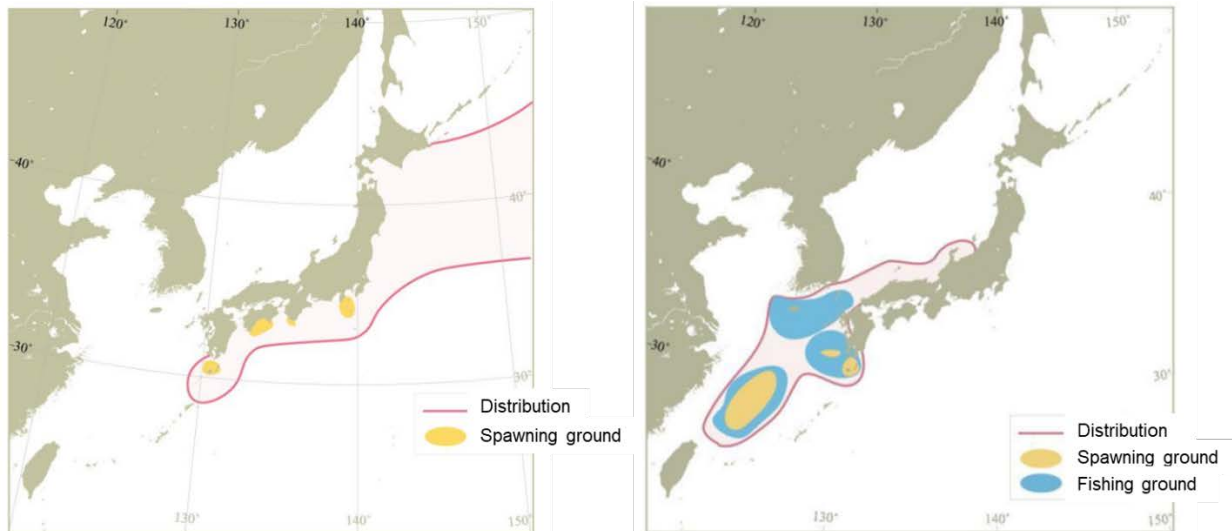


Figure 4: Distribution and spawning ground of the Pacific stock (left) and the East China Sea stock (right) of blue mackerel.

Age and growth

The larvae grow 1mm per day until 5cm FL after hatching observed by otolith reading, then it grows 15cm after 80days, and over 20cm of 120 days after hatching. The scale annuli reading is practical for the fish after subadult stage, it is used for the survey. Otolith annuli and daily ring readings are also effective for age determination. Recent analysis for age and growth from sampling of catch indicates fish becoming 20-25cm FL at age 0 in fall, 28-31cm at age 1 in summer, 30-34cm at age 2, 33-36cm at age 3, around 37cm at age 4, and 45cm at the maximum. The longevity was estimated around age 6 from size composition of catch, but the oldest age 11 was reported. The growth at younger ages is different by area, and in the western area of offshore Kumano there is a tendency for faster growth than fish occur in the water north of Izu Islands. The average length (FL), weight (average weight in catch in 2014 to 2018) by age are shown in Fig. 5.

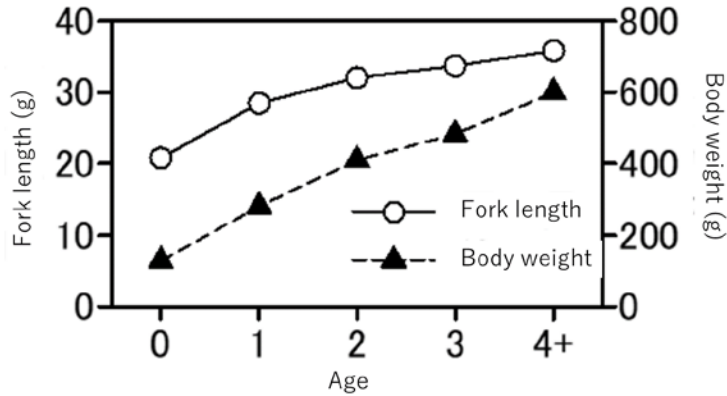


Figure 5: Relationship between age and fork length and relationship between age and body weight of blue mackerel.

Reproduction

The blue mackerel mature and spawn above 30cm FL from the observation of ovary tissue. The mature age was considered age 2 and above and it is assumed that all the fish age 2 and above are mature and spawn (Figs. 5. 6). The spawning grounds are found from the waters southern Kyusyu and cape Ashizuri to the Kuroshio current water near Izu Islands (Fig4). The recruitments hatched at the larger spawning ground in the East China sea supposed to migrate into the Pacific water. A spawning season are from December to June next year at the western waters of cape Ashizuri, January to March in the East China sea, and February to March near the water of cape Ashizur. The spawning season of main spawning ground of blue mackerel near Izu Island are March to June, but it considered that it is not suitable as spawning grounds by the short spawning season from the ovary tissue observation and small amount of spawning eggs sampled. However, it is supposed that larvae and juvenile occurring in the north of transition area consist of the fish hatched at the Izu Island spawning grounds in March to June, same as chub mackerel.

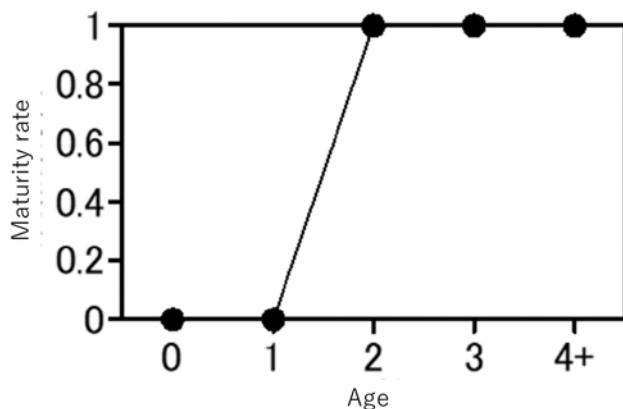


Figure 6: Maturity rate by age.

Predator-prey relationship

Larvae feed on planktonic crustaceans and larvae of anchovy or sardines. Juveniles feed on small teleost and cephalopods with preys mentioned above. It preys on fishes including anchovy, benthooth and lantern fishes, crustaceans like krill and cephalopods at the Kumano Nada fishing ground, horned krill and anchovy at Sanriku fishing ground and copepod, krill, anchovy, lantern fishes, cephalopod like Enoploteuthidae and salpa in the transition area between Kuroshio and Oyashio where located offshore of Joban and Sanriku. Predation on blue mackerel by whales is observed during periods of high abundance.

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Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean

CMM 2021-05
(Entered into force 10 July 2021)

**CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE
ECOSYSTEMS IN THE NORTHWESTERN PACIFIC OCEAN**

The North Pacific Fisheries Commission (NPFC),

Strongly supporting protection of vulnerable marine ecosystems (VMEs) and sustainable management of fish stocks based on the best scientific information available;

Recalling the United Nations General Assembly Resolutions (UNGA) on Sustainable Fisheries, particularly paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, and paragraphs 69 and 80 to 91 of UNGA61/105 in 2006;

Noting, in particular, paragraphs 66 and 69 of UNGA59/25 that call upon States to take action urgently to address the issue of bottom trawl fisheries on VMEs and to cooperate in the establishment of new regional fisheries management organizations or arrangements;

Recognizing further that fishing activities, including bottom fisheries, are an important contributor to the global food supply and that this must be taken into account when seeking to achieve sustainable fisheries and to protect VMEs;

Recognizing the importance of collecting scientific data to assess the impacts of these fisheries on marine species and VMEs;

Concerned about possible adverse impacts of unregulated expansion of bottom fisheries on marine species and VMEs in the western part of the Convention Area.

Adopts the following Conservation and Management Measure:

1. Scope

A. Coverage

These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northwestern Pacific Ocean, defined, for the purposes of this document, as those occurring in the Convention Area as set out in Article 4 of the Convention text to the west of the line of 175 degrees W longitude (here in after called “the western part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

B. Management target

Bottom fisheries conducted by vessels operating in the western part of the Convention Area.

2. General purpose

Sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area.

The objective of these Measures is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur.

These measures shall set out to prevent significant adverse impacts on VMEs in the Convention Area of the North Pacific Ocean, acknowledging the complex dependency of fishing resources and species belonging to the same ecosystem within VMEs.

The Commission shall re-evaluate, and as appropriate, revise, the definition based on further consideration of the work done through FAO and by NPFC.

3. Principles

The implementation of this CMM shall:

- (a) be based on the best scientific information available,
- (b) be in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
- (c) establish appropriate and effective conservation and management measures,
- (d) be in accordance with the precautionary approach, and
- (e) incorporate an ecosystem approach to fisheries management.

4. Measures

Members of the Commission shall take the following measures in order to achieve sustainable management of fish stocks and protection of VMEs in the western part of the Convention

Area:

- A. Limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
- B. Not allow bottom fisheries to expand into the western part of the Convention Area where no such fishing is currently occurring, in particular, by limiting such bottom fisheries to seamounts located south of 45 degrees North Latitude and refrain from bottom fisheries in other areas of the western part of the Convention Area covered by these measures and also not allow bottom fisheries to conduct fishing operation in areas deeper than 1,500m.
- C. Notwithstanding subparagraphs A and B above, exceptions to these restrictions may be provided in cases where it can be shown that any fishing activity beyond such limits or in any new areas would not have significant adverse impacts (SAIs) on marine species or any VME. Such fishing activity is subject to an exploratory fishery protocol (Annex 1).
- D. Any determinations pursuant to subparagraph C that any proposed fishing activity will not have SAIs on marine species or any VME are to be in accordance with the Science-based Standards and Criteria (Annex 2), which are consistent with the FAO International Guidelines for the Management of Deepsea Fisheries in the High Seas.
- E. Any determinations, by any flag State or pursuant to any subsequent arrangement for the management of the bottom fisheries in the areas covered by these measures, that fishing activity would not have SAIs on marine species or any VMEs, shall be made publicly available through agreed means.
- F. Prohibit its vessels from engaging in directed fishing on the following taxa: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, the classes of *Hexactinellida* and *Demospongiae* in the phylum *Porifera* as well as any other indicator species for VMEs as may be identified from time to time by the SC and approved by the Commission.
- G. Further, considering accumulated information regarding fishing activities in the western part of the Convention Area, in areas where, in the course of fishing operations, cold water corals more than 50Kg and sponges more than 500 kg are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease

bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 12 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species, shall be reported to the Secretariat, through the Member, within one business day. The Executive Secretary shall, within one business day, immediately notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit bottom fishing vessels from contacting the sea floor with their trawl nets, so that appropriate measures can be adopted in respect of the relevant site. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the VME indicator taxa include cold water corals: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, and the classes of *Hexactinellida* and *Demospongiae* in the phylum Porifera.

Gbis Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.

- H. C-H seamount and Southeastern part of Koko seamount, specifically for the latter seamount, the area South of 34 degrees 57 minutes North, East of the 400m isobaths, East of 171 degrees 54 minutes East, North of 34 degrees 50 minutes North, are closed precautionary for potential VME conservation. Fishing in these areas requires exploratory fishery protocol (Annex 1).
- I. Ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm.
- J. Apply a bottom fisheries closure from November to December.
- K. Limit annual catch of North Pacific armorhead to 15,000 tons for Japan. In years when strong recruitment of North Pacific armorhead is not detected by the monitoring survey (Annex 6), the Commission encourages Japan to limit their catch of North Pacific armorhead by vessels flying its flag to 500 tons, and encourages Korea to limit their catch of North Pacific armorhead by vessels flying its flag to 200 tons. When a strong

recruitment of North Pacific armorhead is detected by the monitoring survey (Annex 6), the Commission encourages that Japan limit the annual catch of North Pacific armorhead by vessels flying its flag to 10,000 tons, and that Korea limit the annual catch of North Pacific armorhead by vessels flying its flag to 2,000 tons. The Commission encourages that catch overages for any given year be subtracted from the applicable annual catch limit in the following year, and that catch underages during any given year not be added to the applicable annual catch limit during the following year.

~~L.A. Development of new fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members without documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area shall be determined in accordance with relevant provisions, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.~~

M. In years when strong recruitment of North Pacific armorhead is not detected (Annex 6), the Commission encourages Japan to limit the annual catch of North Pacific armorhead by vessels flying its flag to 500 tons, and encourages Korea to limit the annual catch of North Pacific armorhead by vessels flying its flag to 200 tons. The Commission encourages that catch overages for any given year be subtracted from the applicable annual catch limit in the following year, and that catch underages during any given year not be added to the applicable annual catch limit during the following year.

N.L. Notwithstanding subparagraph K, when a strong recruitment of North Pacific armorhead is detected through the monitoring surveys as specified in Annex 6, the Commission encourages that Japan limit the annual catch of North Pacific armorhead by vessels flying its flag to 10,000 tons, and that Korea limit the annual catch of North Pacific armorhead by vessels flying its flag to 2,000 tons. The Commission encourages that catch overages for any given year be subtracted from the applicable annual catch limit in the following year, and that catch underages during any given year not be added to the applicable annual catch limit during the following year. During a year when high recruitment is detected, bottom fishing with trawl gear shall be prohibited in specific areas in the Emperor seamounts where half of the catch occurred in 2010 and 2012 (Annex 6). Determination of a strong recruitment year and of the specific areas where bottom fishing with trawl gear is prohibited shall be communicated to all Members and Cooperating Non-Contracting Parties following the procedure specified in Annex 6.

O.M. Catch in the monitoring surveys shall not be included in the catch limits specified in paragraphs M and N but shall be reported to the Secretariat.

N. Development of new fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members without documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area shall be determined in accordance with relevant provisions, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.

~~P.O.~~ Fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members with documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area is not precluded.

~~Q.P.~~ Members shall require vessels flying their flags to use trawl nets with mesh size greater than or equal to 130mm of stretched mesh with 5kg tension in the codend when conducting fishing activities for North Pacific armorhead or splendid alfonsino.

~~R.Q.~~ Task the Scientific Committee with reviewing the appropriate methods for establishing catch limits, and the adequacy and practicability of the adaptive management plan described in subparagraphs K, L, M, N, O, P, Q and Annex 6 from time to time and recommending revisions and actions, if necessary.

~~S.R.~~ Prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets in the following two sites with VME indicator species. A Member of the Commission whose fishing vessels entered these areas shall report to the TCC as to how it ensured the compliance of this measure.

Sites with VME indicator species (Areas surrounded by the straight lines linking the 4 geographical points below)

Northwestern part of Koko Seamount	35-44.75 N 171-07.60 E	35-44.75 N 171-07.80 E
	35-43.80 N 171-07.80 E	35-43.80 N 171-08.00 E
Northern Ridge of Colahan Seamount	31-03.85 N 175-53.40 E	31-03.85 N 175-53.65 E
	31-03.5 N 175-53.50 E	31-03.05 N 175-53.85 E

5. Contingent Action

Members of the Commission shall submit to the SC their assessments of the impacts of fishing activity on marine species or any VMEs, including the proposed management measures to prevent such impact. Such submissions shall include all relevant data and information in support of any such assessment. Procedures for such reviews including procedures for the

provision of advice and recommendations from the SC to the submitting Member are attached (Annex 3). Members will only authorize bottom fishing activity pursuant to para 4 (C).

6. Scientific Information

To facilitate the scientific work associated with the implementation of these measures, each Member of the Commission shall undertake:

A. Reporting of information for purposes of defining the footprint

In implementing paragraphs 4A and 4B, the Members of the Commission shall provide for each year, the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, and areas fished (names of seamounts) to the Secretariat. The Secretariat shall circulate the information received to the other Members consistent with the approved Regulations for Management of Scientific Data and Information. To support assessments of the fisheries and refinement of conservation and management measures, Members of the Commission are to provide updated information on an annual basis.

B. Collection of information

(i) Collection of scientific information from each bottom fishing vessel operating in the western part of the Convention Area.

(a) Catch and effort data

(b) Related information such as time, location, depth, temperature, etc.

(ii) As appropriate, the collection of information from research vessels operating in the western part of the Convention Area.

(a) Physical, chemical, biological, oceanographic, meteorological, etc.

(b) Ecosystem surveys.

(c) Seabed mapping (e.g. multibeam or other echosounder); seafloor images by drop camera, remotely operated underwater vehicle (ROV) and/or autonomous underwater vehicle (AUV).

(iii) Collection of observer data

Duly designated observers from the flag member shall collect information from bottom fishing vessels operating in the western part of the Convention Area. Observers shall collect data in accordance with Annex 5. Each Member of the Commission shall submit the reports to the Secretariat in accordance with Annex 4. The Secretariat shall compile this information on an annual basis and make it available to the Members of the Commission.

7. Control of bottom fishing vessels

To strengthen its control over bottom fishing vessels flying its flag, each Member of the

Commission shall ensure that all such vessels operating in the western part of the Convention Area be equipped with an operational vessel monitoring system.

8. Observers

All vessels authorized to bottom fishing in the western part of the Convention Area shall carry an observer on board.

EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.
2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:
 - (i) precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
 - (ii) precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
 - (iii) regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
 - (iv) measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
 - (v) comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.
3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:
 - (i) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.
 - (ii) The assessment in (i) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.
 - (iii) The SC is to review the information and the assessment submitted in (i) above in accordance with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”
 - (iv) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the basis of comments and recommendations of SC. Any determinations, by any Member of the

Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.
5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.
6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.
7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.
- ~~7.8.~~ [The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4\(1\)\(a\).](#)

Appendix 1.1

Information to be provided before exploratory fisheries start

1. A harvesting plan
 - Name of vessel
 - Flag member of vessel
 - Description of area to be fished (location and depth)
 - Fishing dates
 - Anticipated effort

- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

2. A mitigation plan

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

3. A catch monitoring plan

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

4. A data collection plan

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

Appendix 1.2

Information to be included in the report

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES

1. Introduction

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

2. Purpose

- (1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities¹ on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the Commission.
- (2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as follows:
 - (a) The fisheries are conducted in the Convention Area;
 - (b) The total catch (everything brought up by the fishing gear) includes species that can

¹ “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.

- only sustain low exploitation rates; and
- (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations.

3. Definition of VMEs

- (1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold-water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.
- (2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).
- (3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.
- (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
- (i) Habitats that contain endemic species;
 - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
 - (iii) Nurseries or discrete feeding, breeding, or spawning areas.
- (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.
- (c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities
- (d) Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:

- (i) Slow growth rates
 - (ii) Late age of maturity
 - (iii) Low or unpredictable recruitment
 - (iv) Long-lived
 - (e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.
- (4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. That is, whether the ecological unit is the entire Area, or the current fishing ground, namely, the Emperor Seamount and Northern Hawaiian Ridge area (hereinafter called “the ES-NHR area”), or a group of the seamounts within the ESNHR area, or each seamount in the ES-NHR area, is to be decided using the above criteria.

4. Identification of potential VMEs

(1) Fished seamounts

(a) Identification of fished seamounts

It is reported that four types of fishing gear are currently used by the members of the Commission in the ES-NHR area, namely, bottom trawl, bottom gillnet, bottom longline and pot. A fifth type of fishing gear (coral drag) was used in the ES-NHR area from the mid-1960s to the late 1980s and is possibly still used by non-members of the Commission. These types of fishing gear are usually used on the top or slope of seamounts, which could be considered VMEs. It is therefore necessary to identify the footprint of the bottom fisheries (fished seamounts) based on the available fishing record. The following seamounts have been identified as fished seamounts: Suiko, Showa, Youmei, Nintoku, Jingu, Ojin, Northern Koko, Koko, Kinmei, Yuryaku, Kammu, Colahan, and CH. Since the use of most of these gears in the ES-NHR area dates back to the late 1960s and 1970s, it is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may be physically unsuitable for certain fishing gears. Thus, it is important to know actual fished areas within the same seamount so as to know the gravity of the impact of fishing activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when

identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. [The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.](#)

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

5. Assessment of SAIs on VMEs or marine species

(1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.

(2) When determining the scale and significance of an impact, the following six factors are to be considered:

- (a) The intensity or severity of the impact at the specific site being affected;
- (b) The spatial extent of the impact relative to the availability of the habitat type affected;
- (c) The sensitivity/vulnerability of the ecosystem to the impact;
- (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;

- (e) The extent to which ecosystem functions may be altered by the impact; and
- (f) The timing and duration of the impact relative to the period in which a species needs the habitat during one or more life-history stages.

(3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

(4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.

(5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:

- (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
- (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
- (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;
- (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
- (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
- (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.

(6) Impact assessments are to consider, as appropriate, the information referred to in these Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.

(7) Where an assessment concludes that the area does not contain VMEs or that significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

Annex 2.1

Examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which may contribute to forming VMEs:	
a.	certain cold-water corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), black corals (antipatharia),

	and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyophores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and
d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities referred to above:

- a. submerged edges and slopes (e.g., corals and sponges)
- b. summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges and xenophyophores)
- c. canyons and trenches (e.g., burrowed clay outcrops, corals),
- d. hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
- e. cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

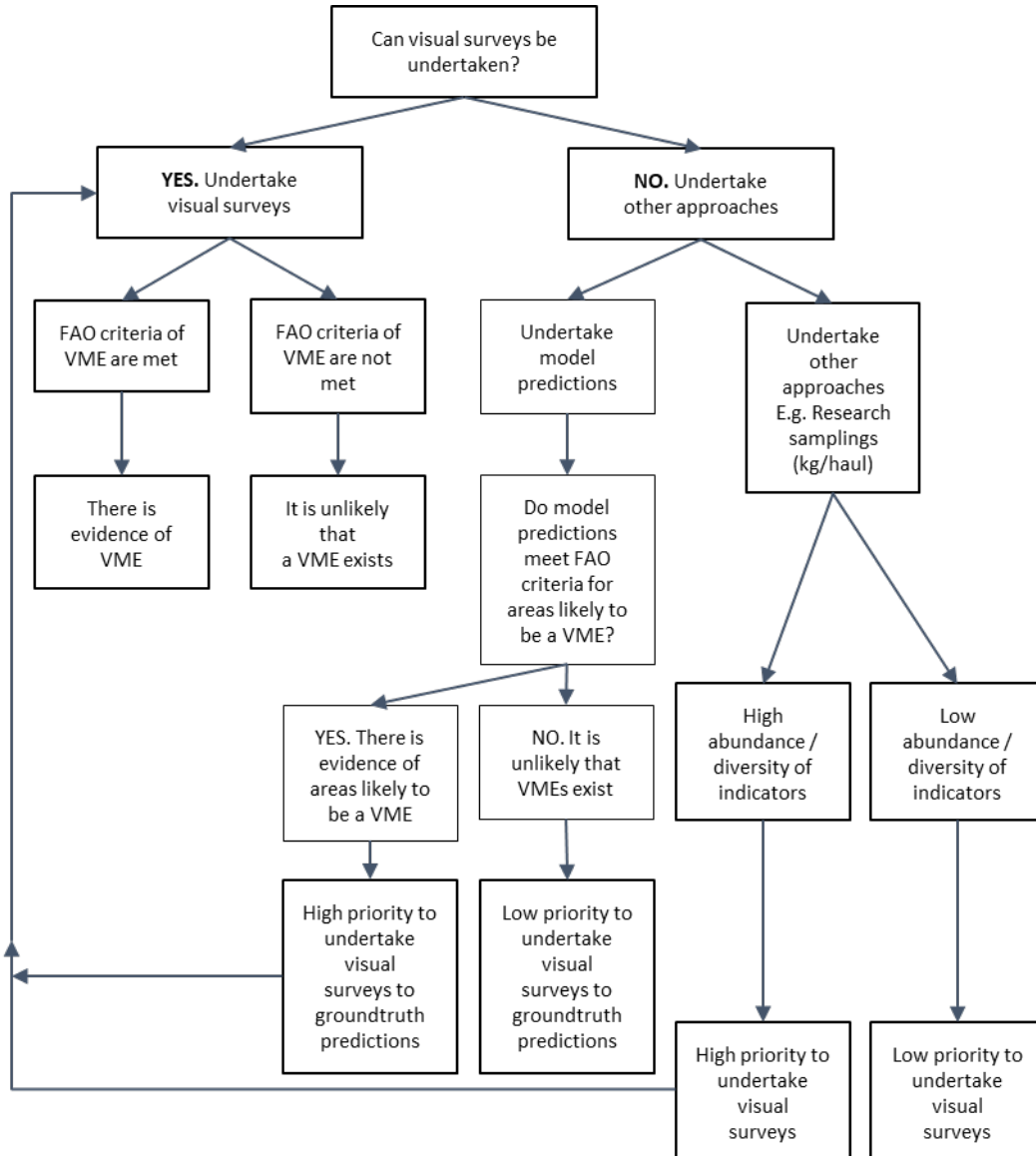
Annex 2.2

Template for reports on identification of VMEs and assessment of impacts caused by individual fishing activities on VMEs or marine species

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)
3. Status of the fishery (existing fishery or exploratory fishery)
4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)
 - (1) Number of fishing vessels
 - (2) Tonnage of each fishing vessel
 - (3) Number of fishing days or days on the fishing ground
 - (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots per day for pot, total length of net per day for gillnet)
 - (5) Total catch by species
 - (6) Names of seamounts fished or to be fished
7. Fishing period

8. Analysis of status of fishery resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
9. Analysis of status of bycatch species resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
10. Analysis of existence of VMEs in the fishing ground
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species
12. Other points to be addressed
13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).

Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM FISHING ACTIVITIES

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch Data: Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- Length Frequency Data: Number of fish measured per species, by area and season.
- Biological Data: Type and quantity of other biological data or samples (otoliths, sex, maturity, etc.) collected per species.
- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Detection of Fishing in Association with Vulnerable Marine Ecosystems

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

E. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

F. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

NPFC BOTTOM FISHERIES OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
 - (a) NPFC vessel ID.
 - (b) Observer's name.
 - (c) Observer's organisation.
 - (d) Date observer embarked (UTC date).
 - (e) Port of embarkation.
 - (f) Date observer disembarked (UTC date).
 - (g) Port of disembarkation.

B. Catch & Effort Data to be collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - (a) Tow start date (UTC).
 - (b) Tow start time (UTC).
 - (c) Tow end date (UTC).
 - (d) Tow end time (UTC).
 - (e) Tow start position (Lat/Lon, 1 minute resolution).
 - (f) Tow end position (Lat/Lon, 1 minute resolution).
 - (g) Type of trawl, bottom or mid-water.
 - (h) Type of trawl, single, double or triple.
 - (i) Height of net opening (m).
 - (j) Width of net opening (m).
 - (k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
 - (l) Gear depth (of footrope) at start of fishing (m).
 - (m) Bottom (seabed) depth at start of fishing (m).
 - (n) Gear depth (of footrope) at end of fishing (m).
 - (o) Bottom (seabed) depth at end of fishing (m).

- (p) Status of the trawl operation (no damage, lightly damaged*, heavily damaged*, other (specify)).
*Degree may be evaluated by time for repairing (≤ 1 hr or > 1 hr).
- (q) Duration of estimated period of seabed contact (minute)
- (r) Intended target species.
- (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- (t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
 - (a) Set start date (UTC).
 - (b) Set start time (UTC).
 - (c) Set end date (UTC).
 - (d) Set end time (UTC).
 - (e) Set start position (Lat/Lon, 1 minute resolution).
 - (f) Set end position (Lat/Lon, 1 minute resolution).
 - (g) Net panel ("tan") length (m).
 - (h) Net panel ("tan") height (m).
 - (i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - (j) Bottom depth at start of setting (m).
 - (k) Bottom depth at end of setting (m).
 - (l) Number of net panels for the set.
 - (m) Number of net panels retrieved.
 - (n) Number of net panels actually observed during the haul.
 - (o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - (p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.
 - (q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.
 - (r) Intended target species.
 - (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).

- (t) Estimate of the amount (weight or volume) of all marine resources discarded* and dropped off, split by species. * Including those retained for scientific samples.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - (a) Set start date (UTC).
 - (b) Set start time (UTC).
 - (c) Set end date (UTC).
 - (d) Set end time (UTC).
 - (e) Set start position (Lat/Lon, 1 minute resolution).
 - (f) Set end position (Lat/Lon, 1 minute resolution).
 - (g) Total length of longline set (m).
 - (h) Number of hooks or traps for the set.
 - (i) Bottom (seabed) depth at start of set.
 - (j) Bottom (seabed) depth at end of set.
 - (k) Number of hooks or traps actually observed during the haul.
 - (l) Intended target species.
 - (m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - (n) An estimation of the amount (numbers or weight) of marine resources discarded* or dropped-off, split by species, during the actual observation. * Including those retained for scientific samples.
 - (o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

E. Length-Frequency Data to Be Collected

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).

2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological sampling to be conducted (optional for gillnet and long line fisheries)

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - (a) Species
 - (b) Length (to the nearest mm), with record of the type of length measurement used.
 - (c) Length and depth in case of North Pacific armorhead.
 - (d) Sex (male, female, indeterminate, not examined)
 - (e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.
5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be collected on Incidental Captures of Protected Species

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
 - (a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - (b) Count of the number caught per tow or set.
 - (c) Life status (vigorous, alive, lethargic, dead) upon release.
 - (d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - (a) Species (identified as far as possible or accompanied by a photograph where identification is difficult).
 - (b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the fishing operation.
 - (c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the fishing operation.
 - (d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

I. Data to be collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - (a) Observer name.
 - (b) Vessel name.
 - (c) Vessel call sign.
 - (d) Vessel flag.
 - (e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
 - (f) Species from which tag recovered.
 - (g) Tag colour and type (spaghetti, archival).
 - (h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
 - (i) Date and time of capture (UTC).
 - (j) Location of capture (Lat/Lon, to the nearest 1 minute)
 - (k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
 - (l) Sex (F=female, M=male, I=indeterminate, D=not examined)
 - (m) Whether the tags were found during a period of fishing that was being observed (Y/N)
 - (n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

1. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
2. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - (a) Fishing Operation Information
 - All vessel and tow / set / effort information.
 - (b) Monitoring of Catches
 - Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
 - Record numbers or proportions of each species retained or discarded.
 - (c) Biological Sampling
 - Length-frequency data for target species.
 - Length-frequency data for main by-catch species.
 - Identification and counts of protected species.
 - Basic biological data (sex, maturity) for target species.
 - Check for presence of tags.
 - Otoliths (and stomach samples, if being collected) for target species.
 - Basic biological data for by-catch species.
 - Biological samples of by-catch species (if being collected)
 - Photos
3. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsino)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be used for Recording Observer Data

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
 - (a) Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
 - (b) Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - (c) Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
 - (a) Kilograms are to be used to describe catch weight.
 - (b) Metres are to be used to describe height, width, depth, beam or length.
 - (c) Cubic metres are to be used to describe volume.
 - (d) Kilowatts are to be used to describe engine power.

**Implementation of the Adaptive Management for North Pacific armorhead
(in 2021)**

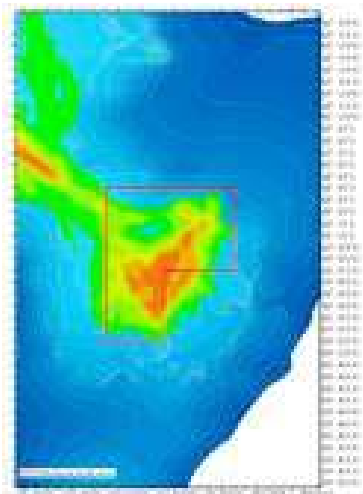
1. Monitoring survey for the detection of strong recruitment of North Pacific armorhead

(1) Location of monitoring surveys

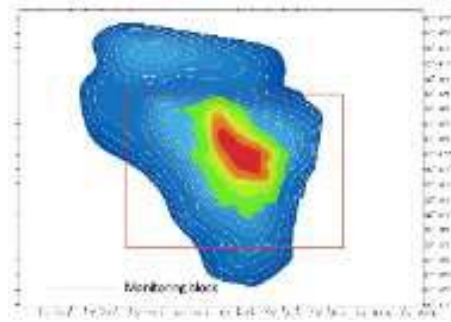
Monitoring surveys for the detection of strong recruitment of North Pacific armorhead will be conducted by trawl fishing vessels in the pre-determined four (24) monitoring blocks of Koko (South eastern), Yuryaku, Kammu (North western) and/or Colahan seamounts.

Monitoring blocks

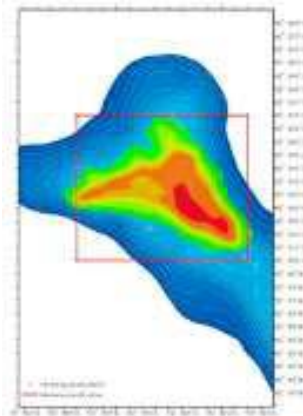
- (1) Koko seamount (34°51' –35°04'N, 171°49' –172°00' E)



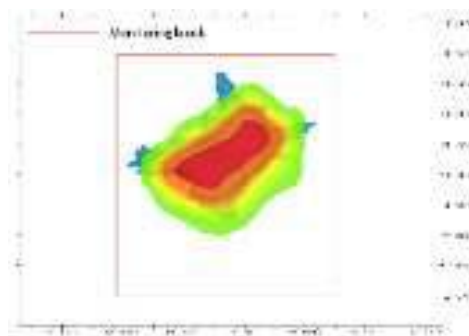
- (2) Yuryaku seamount (32°35' –32°45'N, 172°10' –172°24'E)



(3) Kammu seamount ($32^{\circ}10' - 32^{\circ}21'N$, $172^{\circ}44' - 172^{\circ}57'E$)



(4) Colahan seamount ($30^{\circ}57' - 31^{\circ}05'N$, $175^{\circ}50' - 175^{\circ}57'E$)



(2) Schedule for monitoring surveys

Monitoring surveys will be conducted from March 1st to June 30th each year, with at least a one

week interval between monitoring surveys. For each survey, a trawl fishing vessel will conduct a monitoring survey in one of the four monitoring blocks that is the nearest from the location of the trawl fishing vessel at the time of prior notification in (4) below. The base schedule for monitoring surveys will be notified to the Executive Secretary by the end of February of each year. The base schedule may be revised during the year subject to prior notification to the Executive Secretary.

(3) Data to be collected during monitoring surveys

For each monitoring survey, a trawl net will be towed for one hour. A scientific observer onboard the trawl fishing vessel will calculate nominal-CPUE (kg/hour) of North Pacific armorhead. The scientific observer will also calculate fat index* (FI) of randomly sampled 100 individuals of North Pacific armorhead by measuring fork length (FL) and body height (BH) of each individual.

(*fat index (FI) = body height (BH) / fork length (FL))

(4) Prior notifications and survey results

At least three (3) days before each survey, a prior notification with monitoring date/time, location and trawl fishing vessel name will be provided by the flag state of the trawl fishing vessel to the Executive Secretary.

No later than three (3) days after each survey, the survey result including date/time, location, catch, nominal-CPUE (kg/hour) and percentage of fish with fat index (FI)>0.3 will be provided by the flag state to the Executive Secretary.

The Executive Secretary will circulate these prior notifications and survey results to all Members of the Commission without delay.

1. Areas where bottom fishing with trawl gear is prohibited when high recruitment is detected

(1) Criteria for a high recruitment

It is considered that high recruitment has occurred if the following criteria are met in four (4) consecutive monitoring surveys.

- Nominal CPUE > 10t/h
- Individuals of fat index (FI)> 0.3 account for 80% or more

(2) Areas where bottom fishing with trawl gear is prohibited

Bottom fishing with trawl gear shall be prohibited in the following two (2) seamount areas (*) during the year when high recruitment is detected. In such a case, all monitoring surveys scheduled during the year will be cancelled.

- Northern part of Kammu seamount (north of 32°10.0' N)
- Yuryaku seamount

(*) The catch of North Pacific armorhead in the above two seamounts accounts for a half of the total catch in the entire Emperor Seamounts area based on the catch records in 2010 and 2012.

(3) Notification by the Secretariat

When the criteria for high recruitment are met as defined in 2(1) above, the Executive Secretary will notify all Members of the Commission of the fact with a defined date/time from which bottom fishing with trawl gear is prohibited in the areas as defined in 2(2) above until the end of the year.

Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean

CMM 2019-06

(Entered into force 29 November 2019)

**CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE
ECOSYSTEMS IN THE NORTHEASTERN PACIFIC OCEAN**

The North Pacific Fisheries Commission (NPFC):

Seeking to ensure the long term conservation and sustainable use of the fishery resources of the Northeastern Pacific Ocean and, in so doing, protect the vulnerable marine ecosystems that occur there, in accordance with the Sustainable Fisheries Resolutions adopted by the United Nations General Assembly (UNGA) including, in particular, paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, paragraphs 69 and 80 to 91 of UNGA61/105 in 2006, and paragraphs 113 to 124 of UNGA64/72 in 2009;

Recalling that paragraph 85 of UNGA 61/105 calls upon participants in negotiations to establish regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to adopt permanent measures in respect of the area of application of the instruments under negotiation;

Noting that North Pacific Fisheries Commission has previously adopted interim measures for the Northeastern Pacific Ocean;

Conscious of the need to adopt permanent measures for the Northeastern Pacific Ocean to ensure that this area is not left as the only major area of the Pacific Ocean where no such measures are in place;

Hereby adopt the following Conservation and Management Measure (CMM) for bottom fisheries of the Northeastern Pacific Ocean while working to develop and implement other permanent management arrangements to govern these and other fisheries in the North Pacific Ocean.

Scope

1. These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northeastern Pacific Ocean, defined, for the purposes of this document, as those

occurring in the Convention Area as set out in Article 4 of the Convention text to the east of the line of 175 degrees W longitude (here in after called “the eastern part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

For the purpose of these Measures, the term vulnerable marine ecosystems is to be interpreted and applied in a manner consistent with the International Guidelines on the Management of Deep Sea Fisheries on the High Seas adopted by the FAO on 29 August 2008 (see Annex 2 for further details).

2. The implementation of these Measures shall:

- a. be based on the best scientific information available in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
- b. establish appropriate and effective conservation and management measures,
- c. be in accordance with the precautionary approach, and
- d. incorporate an ecosystem approach to fisheries management.

3. Actions by Members of the Commission

Members of the Commission will take the following actions in respect of vessels operating under its Flag or authority in the area covered by these Measures:

- a. Conduct the assessments called for in paragraph 83(a) of UNGA Resolution 61/105, in a manner consistent with the FAO Guidelines and the Standards and Criteria included in Annex 2;
- b. Submit to the SC their assessments conducted pursuant to subparagraph (a) of this paragraph, including all relevant data and information in support of any such assessment, and receive advice and recommendations from the SC, in accordance with the procedures in Annex 3;
- c. Taking into account all advice and recommendations received from the SC, determine whether the fishing activity or operations of the vessel in question are likely to have a significant adverse impact on any vulnerable marine ecosystem;
- d. If it is determined that the fishing activity or operations of the vessel or vessels in question would have a significant adverse impact on vulnerable marine ecosystems, adopt conservation and management measures to prevent such impacts on the basis of advice and recommendations of the SC, which are subject to adoption by the Commission;
- e. Ensure that if any vessels are already engaged in bottom fishing, that such assessments have been carried out in accordance with paragraph 119(a)/UNGA RES 2009, the determination

- called for in subparagraph (c) of this paragraph has been rendered and, where appropriate, managements measures have been implemented in accordance with the advice and recommendations of the SC, which are subject to adoption by the Commission;
- f. Further ensure that they will only authorize fishing activities on the basis of such assessments and any comments and recommendations from the SC;
 - g. Prohibit its vessels from engaging in directed fishing on the following orders: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, the classes of *Hexactinellida* and *Demospongiae* in the phylum *Porifera* as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the Commission;
 - h. In respect of areas where vulnerable marine ecosystems are known to occur or are likely to occur, based on the best available scientific information, ensure that bottom fishing activities do not proceed unless conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems;
 - i. Limit fishing effort in bottom fisheries on the Eastern part of the Convention Area to the level of a historical average (baseline to be determined through consensus in the SC based on information to be provided by Members) in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems dependent on new SC advice;
 - j. Further, considering accumulated information regarding fishing activities in the Eastern part of the Convention Area, in areas where, in the course of fishing operations, cold water corals ~~or other indicator species as identified by the SC~~ that exceed 50Kg and 500 kg of *Hexactinellida* and *Demospongiae* are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 12 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species in question, shall be reported to the Secretariat, through the Member, within one business day, as soon as possible, The Executive Secretary ~~who~~ shall notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets, so that appropriate measures can be adopted in respect of the relevant site. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the VME indicator taxa include cold water corals ~~include:~~ *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, and the classes of *Hexactinellida* and *Demospongiae* in the phylum *Porifera*. ~~as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the~~

Commission.

j-k. Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.

4. All assessments and determinations by any Member as to whether fishing activity would have significant adverse impacts on vulnerable marine ecosystems, as well as measures adopted in order to prevent such impacts, will be made publicly available through agreed means.

Control of Bottom Fishing Vessels

5. Members will exercise full and effective control over each of their bottom fishing vessels operating in the high seas of the Northeastern Pacific Ocean, including by means of fishing licenses, authorizations or permits, and maintenance of a record of these vessels as outlined in the Convention and applicable CMM.
6. New and exploratory fishing will be subject to the exploratory fishery protocol included as Annex 1.

Scientific Committee (SC)

7. Scientific Committee will provide scientific support for the implementation of these CMMs.

Scientific Information

8. The Members shall provide all available information as required by the Commission for any current or historical fishing activity by their flag vessels, including the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, areas fished (names or coordinates of seamounts), and information from scientific observer programmes (see Annexes 4 and 5) to the NPFC Secretariat as soon as possible and no later than one month prior to SC meeting. The Secretariat will make such information available to SC.
9. Scientific research activities for stock assessment purposes are to be conducted in accordance with a research plan that has been provided to SC prior to the commencement of such activities.

EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.

2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:

- i. precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
- ii. precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
- iii. regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
- iv. measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
- v. comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.

3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:

(1) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.

(2) The assessment in (1) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.

(3) The SC is to review the information and the assessment submitted in (1) above in accordance

with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”

(4) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the basis of comments and recommendations of SC. Any determinations, by any Member of the Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.

5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.

6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.

7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.

[8. The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4\(1\)\(a\).](#)

Appendix 1.1

Information to be provided before exploratory fisheries start

1. A harvesting plan

- Name of vessel

- Flag member of vessel
- Description of area to be fished (location and depth)
- Fishing dates
- Anticipated effort
- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

2. A mitigation plan

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

3. A catch monitoring plan

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

4. A data collection plan

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

Appendix 1.2

Information to be included in the report

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES

1. Introduction

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

2. Purpose

(1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities² on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the Commission.

(2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as follows:

² “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.

- (a) The fisheries are conducted in the Convention Area;
- (b) The total catch (everything brought up by the fishing gear) includes species that can only sustain low exploitation rates; and
- (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations

3. Definition of VMEs

(1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.

(2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover, or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).

(3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.

- (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
 - (i) Habitats that contain endemic species;
 - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
 - (iii) Nurseries or discrete feeding, breeding, or spawning areas
- (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.
- (c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities

(d) Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:

- (i) Slow growth rates
- (ii) Late age of maturity
- (iii) Low or unpredictable recruitment
- (iv) Long-lived

(e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

(4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. For example, whether the ecological unit is a group of seamounts, or an individual seamount in the Convention Area, is to be decided using the above criteria.

4. Identification of potential VMEs

(1) Fished seamounts

(a) Identification of fished seamounts

It is reported that two types of fishing gear are currently used by members of the Commission in the NE area, namely long-line hook and long-line trap. The footprint of the bottom fisheries (fished seamounts) is identified based on the available fishing record. The following seamounts have been identified as fished seamounts at some point in the past: Brown Bear, Cobb, Warwick, Eickelberg, Pathfinder, Miller, Murray, Cowie, Surveyor, Pratt, and Durgin. It is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may be physically unsuitable for certain fishing gears. Thus, it is important to know actual fished areas within the same seamount so as to know the gravity of the impact of fishing activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. [The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.](#)

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

5. Assessment of SAIs on VMEs or marine species

(1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.

(2) When determining the scale and significance of an impact, the following six factors are to be considered:

- (a) The intensity or severity of the impact at the specific site being affected;
- (b) The spatial extent of the impact relative to the availability of the habitat type affected;
- (c) The sensitivity/vulnerability of the ecosystem to the impact;
- (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;
- (e) The extent to which ecosystem functions may be altered by the impact; and
- (f) The timing and duration of the impact relative to the period in which a species needs the habitat during one or more life-history stages.

(3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features

of the populations and ecosystems.

(4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.

(5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:

- (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
- (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
- (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment
- (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
- (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
- (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.

(6) Impact assessments are to consider, as appropriate, the information referred to in these Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.

(7) Where an assessment concludes that the area does not contain VMEs or that significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated

when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

ANNEX 2.1

EXAMPLES OF POTENTIAL VULNERABLE SPECIES GROUPS, COMMUNITIES AND HABITATS AS WELL AS FEATURES THAT POTENTIALLY SUPPORT THEM

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which
--

may contribute to forming VMEs:	
a.	certain coldwater corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), black corals (antipatharia), and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyphores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and
d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities, referred to above:	
a.	submerged edges and slopes (e.g., corals and sponges),
b.	summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges, xenophyphores),
c.	canyons and trenches (e.g., burrowed clay outcrops, corals),
d.	hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
e.	cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

ANNEX 2.2

TEMPLATE FOR REPORTS ON IDENTIFICATION OF VMEs AND ASSESSMENT OF IMPACTS CAUSED BY INDIVIDUAL FISHING ACTIVITIES ON VMEs OR MARINE SPECIES

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)
3. Status of the fishery (existing fishery or exploratory fishery)
4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)
 - (1) Number of fishing vessels
 - (2) Tonnage of each fishing vessel
 - (3) Number of fishing days or days on the fishing ground
 - (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots per

day for pot, total length of net per day for gillnet)

(5) Total catch by species

(6) Names of seamounts fished or to be fished

7. Fishing period

8. Analysis of status of fishery resources

(1) Data and methods used for analysis

(2) Results of analysis

(3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties

9. Analysis of status of bycatch species resources

(1) Data and methods used for analysis

(2) Results of analysis

(3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties

10. Analysis of existence of VMEs in the fishing ground

(1) Data and methods used for analysis

(2) Results of analysis

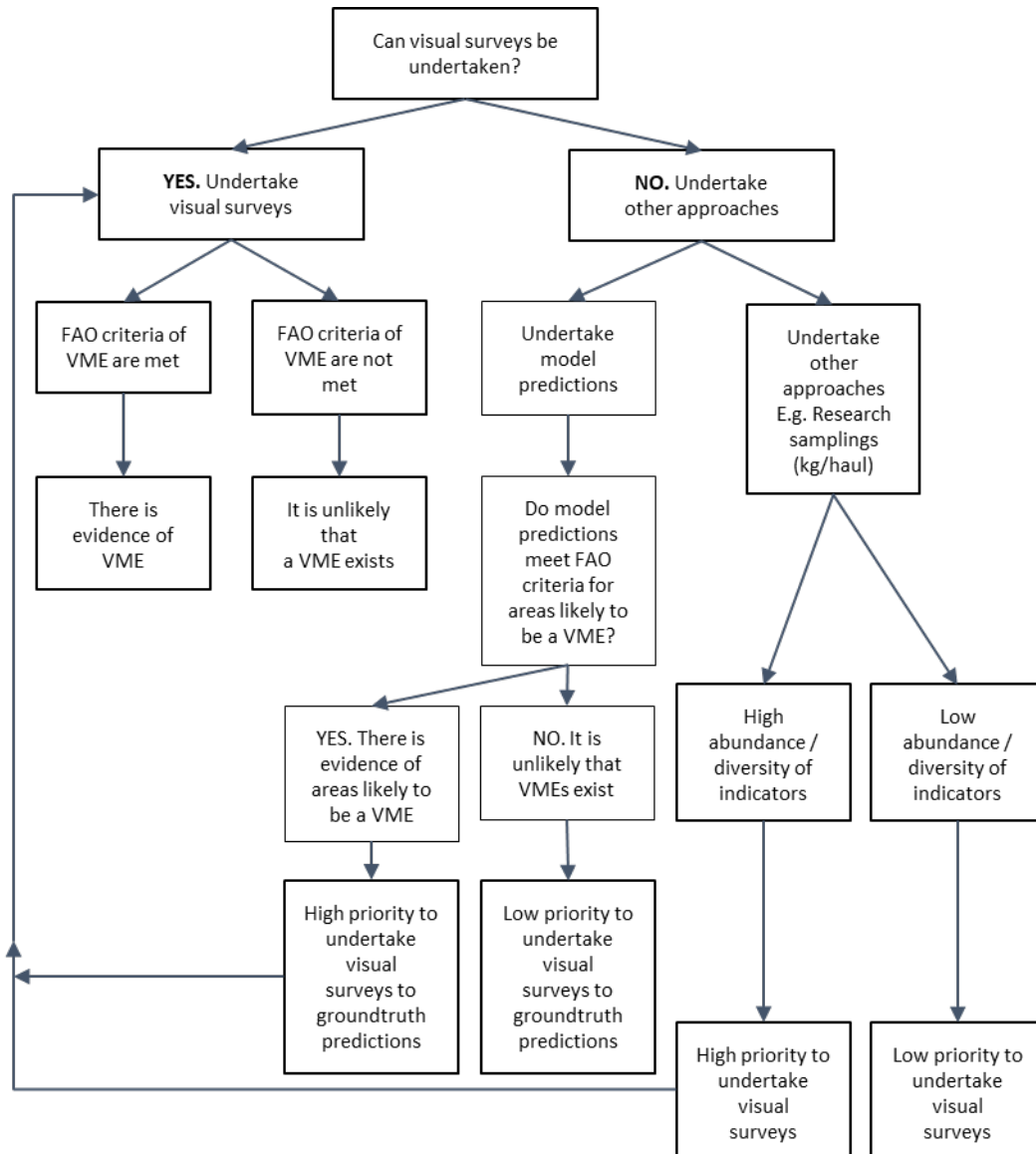
(3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties

11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species

12. Other points to be addressed

13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).

Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM FISHING ACTIVITIES

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons

- **Catch Data:** Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- **Length Frequency Data:** Number of fish measured per species, by area and season.
- **Biological Data:** Type and quantity of other biological data or samples (otoliths, sex, maturity, etc) collected per species.
- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Detection of Fishing in Association with Vulnerable Marine Ecosystems

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

E. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

F. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

**NPFC BOTTOM FISHERIES
OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT**

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
 - a) NPFC vessel ID
 - b) Observer's name.
 - c) Observer's organisation.
 - d) Date observer embarked (UTC date).
 - e) Port of embarkation.
 - f) Date observer disembarked (UTC date).
 - g) Port of disembarkation.

B. Catch & Effort Data to be collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - a) Tow start date (UTC).
 - b) Tow start time (UTC).
 - c) Tow end date (UTC).
 - d) Tow end time (UTC).
 - e) Tow start position (Lat/Lon, 1 minute resolution).
 - f) Tow end position (Lat/Lon, 1 minute resolution).
 - g) Type of trawl, bottom or mid-water.
 - h) Type of trawl, single, double or triple.
 - i) Height of net opening (m).
 - j) Width of net opening (m).
 - k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
 - l) Gear depth (of footrope) at start of fishing (m).
 - m) Bottom (seabed) depth at start of fishing (m).

- n) Gear depth (of footrope) at end of fishing (m).
- o) Bottom (seabed) depth at end of fishing (m).
- p) Status of the trawl operation (no damage, lightly damaged*, heavily damaged*, other (specify)). *Degree may be evaluated by time for repairing (≤ 1 hr or > 1 hr)
- q) Duration of estimated period of seabed contact (minute)
- r) Intended target species.
- s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
 - a) Set start date (UTC).
 - b) Set start time (UTC).
 - c) Set end date (UTC).
 - d) Set end time (UTC).
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).
 - g) Net panel (“tan”) length (m).
 - h) Net panel (“tan”) height (m).
 - i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - j) Bottom depth at start of setting (m).
 - k) Bottom depth at end of setting (m).
 - l) Number of net panels for the set.
 - m) Number of net panels retrieved.
 - n) Number of net panels actually observed during the haul.
 - o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.
 - q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.

- r) Intended target species.
- s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- t) Estimate of the amount (weight or volume) of all marine resources discarded* and dropped-off, split by species. * Including those retained for scientific samples.
- u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - a) Set start date (UTC).
 - b) Set start time (UTC).
 - c) Set end date (UTC).
 - d) Set end time (UTC).
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).
 - g) Total length of longline set (m).
 - h) Number of hooks or traps for the set.
 - i) Bottom (seabed) depth at start of set.
 - j) Bottom (seabed) depth at end of set.
 - k) Number of hooks or traps actually observed during the haul.
 - l) Intended target species.
 - m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - n) An estimation of the amount (numbers or weight) of marine resources discarded* or dropped-off, split by species, during the actual observation. * Including those retained for scientific samples.
 - o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

E. Length-Frequency Data to Be Collected

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to

generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).

2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological sampling to be conducted (optional for gillnet and long line fisheries)

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - a) Species
 - b) Length (to the nearest mm), with record of the type of length measurement used.
 - c) Length and depth in case of North Pacific armorhead.
 - d) Sex (male, female, indeterminate, not examined)
 - e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.
5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be collected on Incidental Captures of Protected Species

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
 - a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - b) Count of the number caught per tow or set.
 - c) Life status (vigorous, alive, lethargic, dead) upon release.
 - d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - a) Species (identified as far as possible, or accompanied by a photograph where identification is difficult).
 - b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the fishing operation.
 - c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the fishing operation.
 - d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

I. Data to be collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - a) Observer name.
 - b) Vessel name.
 - c) Vessel call sign.

- d) Vessel flag.
- e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
- f) Species from which tag recovered.
- g) Tag colour and type (spaghetti, archival).
- h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
- i) Date and time of capture (UTC).
- j) Location of capture (Lat/Lon, to the nearest 1 minute)
- k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
- l) Sex (F=female, M=male, I=indeterminate, D=not examined)
- m) Whether the tags were found during a period of fishing that was being observed (Y/N)
- n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

2. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
3. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - a) Fishing Operation Information
 - All vessel and tow / set / effort information.
 - b) Monitoring of Catches
 - Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
 - Record numbers or proportions of each species retained or discarded.
 - c) Biological Sampling

- Length-frequency data for target species.
- Length-frequency data for main by-catch species.
- Identification and counts of protected species.
- Basic biological data (sex, maturity) for target species.
- Check for presence of tags.
- Otoliths (and stomach samples, if being collected) for target species.
- Basic biological data for by-catch species.
- Biological samples of by-catch species (if being collected)
- Photos

4. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsino)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be used for Recording Observer Data

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:

- a. Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
 - b. Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - c. Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
- a. Kilograms are to be used to describe catch weight.
 - b. Metres are to be used to describe height, width, depth, beam or length.
 - c. Cubic metres are to be used to describe volume.
 - d. Kilowatts are to be used to describe engine power.

Stock Assessment Report for Pacific Saury

Abstract:

This report presents the results of stock assessment of Pacific saury updated at the 10th Small Scientific Committee on Pacific saury meeting held virtually during December 12-15, 2022.

EXECUTIVE SUMMARY

Data used in the assessment modeling

Pacific saury (*Cololabis saira*) is widely distributed from the subarctic to the subtropical regions of the North Pacific Ocean. The fishing grounds are west of 180° E but differ among Members (China, Japan, Korea, Russia, Chinese Taipei, and Vanuatu). Figure 1 shows the historical catches of Pacific saury by Member. Figure 2 shows CPUE and Japanese survey biomass indices used in the stock assessment. Appendix 1 shows data used for the updated stock assessment.

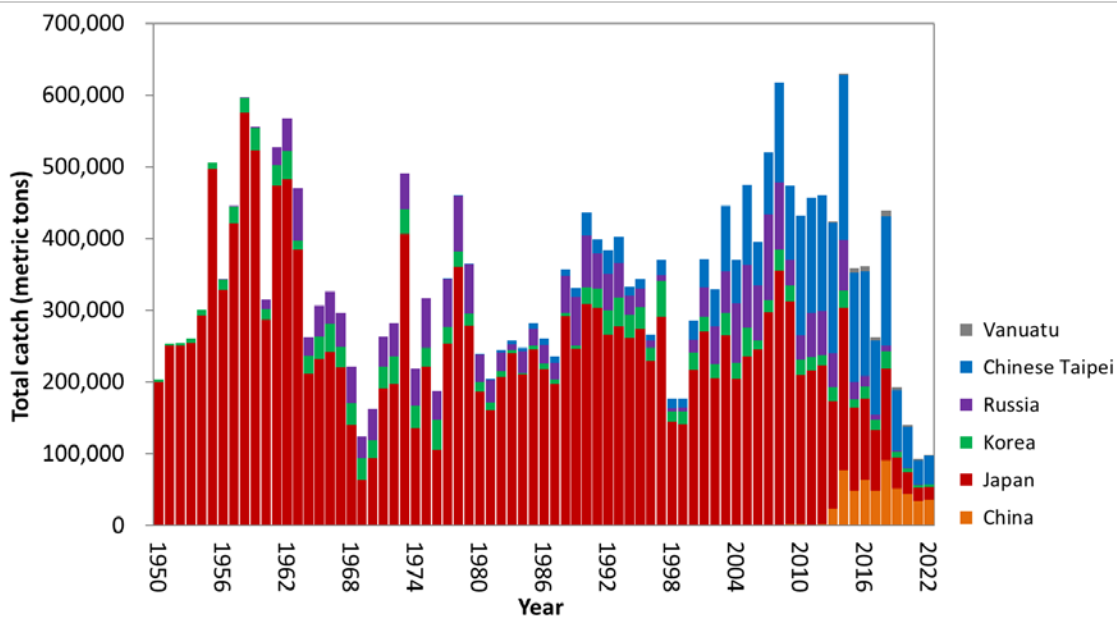


Figure 1. Time series of catch by Member during 1950-2022. The catch data for 1950-1979 are shown but not used in stock assessment modeling. Catch data in 2022 are preliminary (as of 17 December 2022) and not used in the assessment.

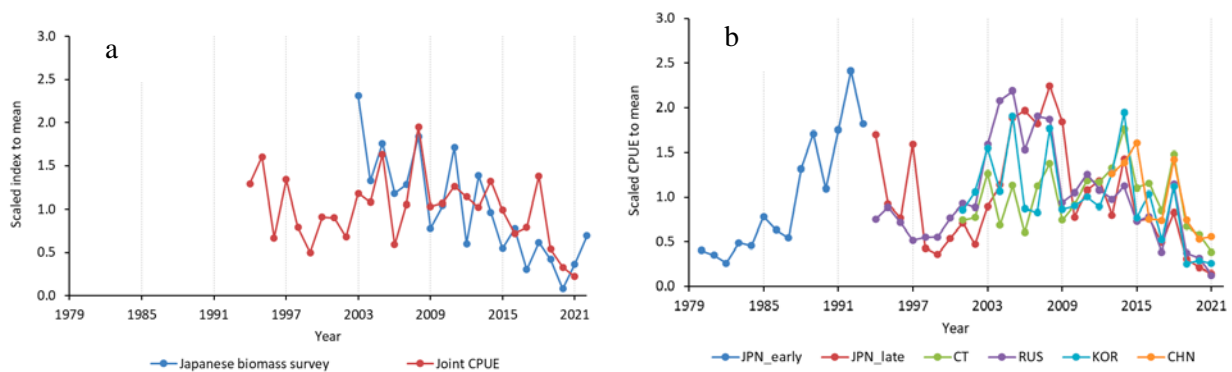


Figure 2. Time series of (a) Japanese survey biomass index and joint CPUE and (b) Member's standardized CPUE indices used in the assessment modeling.

Brief description of specification of analysis and models

A Bayesian state-space production model (BSSPM) used in previous stock assessments was employed as an agreed provisional stock assessment model for Pacific saury during 1980-2022. Scientists from three Members (China, Japan and Chinese Taipei) each conducted analyses following the agreed specification which called for two base case scenarios and two sensitivity scenarios (see Annex F, SSC PS09 report for more details). The two base case scenarios differ in using each Member's standardized CPUEs (base case B1) or standardized joint CPUEs (base case B2). For the two sensitivity cases with Japanese early CPUE (1980-1994), time-varying catchability was assumed to account for potential increases in catchability. A higher weight was given to the Japanese biomass survey estimates than to Members' CPUEs in B1 while comparable weights were given to the Japanese biomass survey estimates and the joint CPUEs in B2. The CPUE data were modeled as nonlinear indices of biomass. Members used similar approaches with some differences in the assumption of the time-varying catchability and prior distributions for the free parameters in the model.

Summary of stock assessment results

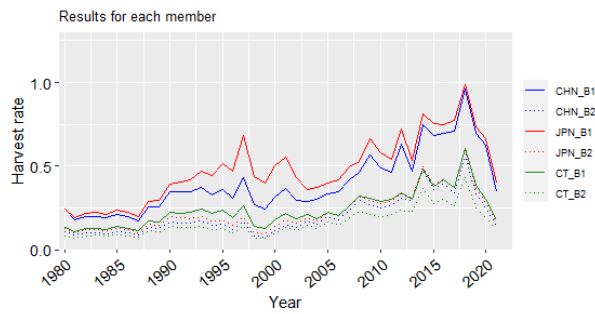
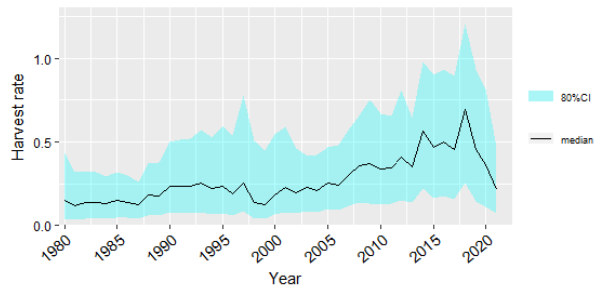
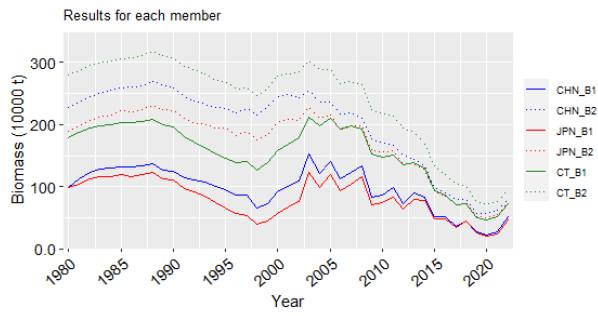
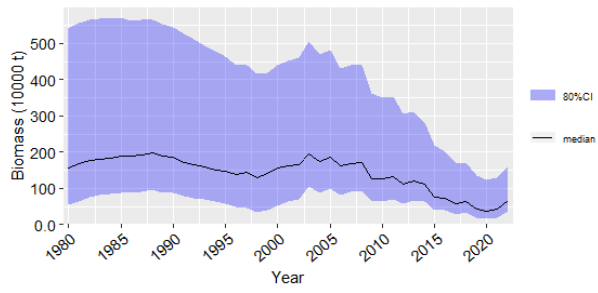
The SSC PS considered the BSSPM results and noted the agreement in trends among Members' results for each base case model. However, there was a marked difference in the biomass level between B1 and B2 due to the different CPUE trends used. The SSC PS discussed and recognized that the results covered a wide range of uncertainties in data, model and estimation, and it therefore concluded the outcomes of MCMC runs could be aggregated over the 6 models (2 base case models x 3 Members) as in the previous assessments. The aggregated results for assessing the overall median values and their associated 80% credible intervals are shown in Table 1. The graphical presentations for times series of a) biomass (B), b) B-ratio ($=B/B_{MSY}$), c) harvest rate (F), d) F-ratio (F/F_{MSY}) and e) B/K are shown in Figure 3. The Kobe plot with time trajectory using aggregated model outcomes is shown in Figure 4. Time series of median estimated values for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K are shown in Table 2.

Table 1. Summary of estimates of reference quantities. Median and credible interval for the aggregated results are presented. In addition, median values of Member's combined results (over B1 and B2) are shown.

	Median	Lower10%	Upper10%	Median_CHN	Median_JPN	Median_CT
C_2021 (10000 t)	9.221	9.221	9.221	9.221	9.221	9.221
AveC_2019_2021 (10000 t)	14.141	14.141	14.141	14.141	14.141	14.141
AveF_2019_2021	0.350	0.111	0.733	0.402	0.456	0.238
F_2021	0.213	0.071	0.467	0.241	0.287	0.149
FMSY	0.313	0.084	0.619	0.363	0.407	0.206
MSY	40.281	29.911	51.100	41.316	40.649	38.850
F_2021/FMSY	0.739	0.452	1.259	0.729	0.740	0.751
AveF_2019_2021/FMSY	1.192	0.757	1.883	1.203	1.169	1.211
K (10000 t)	281.400	142.200	919.083	249.200	224.579	398.200
B_2021 (10000 t)	43.260	19.750	129.400	38.260	32.149	61.950
B_2022 (10000 t)	65.500	36.900	162.000	62.190	56.264	82.035
AveB_2020_2022 (10000 t)	49.147	25.386	138.103	44.845	39.111	66.877
BMSY (10000 t)	131.800	70.360	409.910	118.800	104.432	186.400
BMSY/K	0.469	0.386	0.621	0.465	0.460	0.503
B_2021/K	0.151	0.088	0.240	0.149	0.147	0.159
B_2022/K	0.237	0.122	0.385	0.243	0.251	0.216
AveB_2020_2022/K	0.177	0.103	0.270	0.176	0.179	0.175
B_2021/BMSY	0.315	0.198	0.499	0.310	0.311	0.327
B_2022/BMSY	0.494	0.272	0.810	0.499	0.532	0.447
AveB_2020_2022/BMSY	0.368	0.232	0.564	0.364	0.377	0.360

Table 2. Time series of median estimated values for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K. The unit of biomass is 10,000 tons.

Year	Biomass	HarvestRate	Bratio	Fratio	Depletion
1980	157.678	0.151	1.197	0.524	0.571
1981	167.400	0.122	1.291	0.415	0.614
1982	177.300	0.138	1.376	0.461	0.658
1983	181.800	0.142	1.409	0.473	0.676
1984	184.700	0.134	1.422	0.447	0.683
1985	188.600	0.149	1.447	0.498	0.695
1986	188.600	0.138	1.436	0.464	0.691
1987	191.800	0.123	1.450	0.414	0.698
1988	197.056	0.181	1.481	0.613	0.714
1989	188.700	0.175	1.397	0.602	0.676
1990	185.474	0.235	1.379	0.805	0.664
1991	171.300	0.233	1.274	0.803	0.613
1992	164.900	0.233	1.230	0.807	0.590
1993	159.400	0.252	1.194	0.879	0.569
1994	151.300	0.220	1.137	0.774	0.536
1995	147.519	0.233	1.100	0.838	0.516
1996	138.900	0.192	1.022	0.704	0.478
1997	143.700	0.258	1.026	0.978	0.479
1998	129.800	0.136	0.914	0.526	0.427
1999	141.000	0.125	0.970	0.493	0.453
2000	157.200	0.182	1.099	0.699	0.513
2001	161.700	0.229	1.165	0.838	0.548
2002	165.100	0.199	1.213	0.703	0.575
2003	196.220	0.227	1.452	0.768	0.703
2004	174.200	0.212	1.287	0.720	0.622
2005	187.100	0.253	1.367	0.869	0.663
2006	161.752	0.244	1.194	0.829	0.575
2007	169.900	0.306	1.253	1.037	0.606
2008	172.155	0.359	1.236	1.248	0.604
2009	127.900	0.369	0.939	1.262	0.451
2010	127.100	0.338	0.924	1.167	0.447
2011	133.195	0.343	0.948	1.206	0.463
2012	112.500	0.409	0.828	1.392	0.398
2013	119.329	0.355	0.866	1.219	0.424
2014	111.200	0.566	0.821	1.889	0.403
2015	76.535	0.469	0.563	1.589	0.275
2016	72.586	0.498	0.528	1.704	0.260
2017	57.634	0.456	0.429	1.538	0.206
2018	63.360	0.693	0.469	2.295	0.230
2019	42.200	0.456	0.310	1.562	0.151
2020	38.040	0.367	0.279	1.271	0.134
2021	43.260	0.213	0.315	0.739	0.151
2022	65.500		0.494		0.237



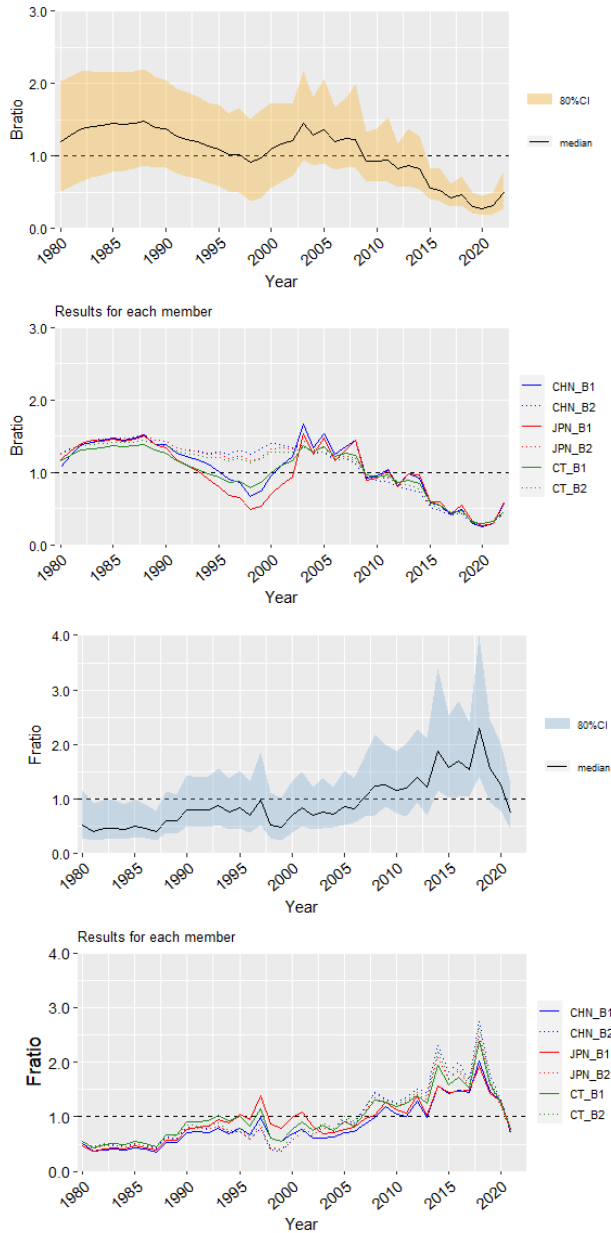


Figure 3. Time series of median estimated values of six runs for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K. The solid and shaded lines correspond to B1 and B2, respectively.

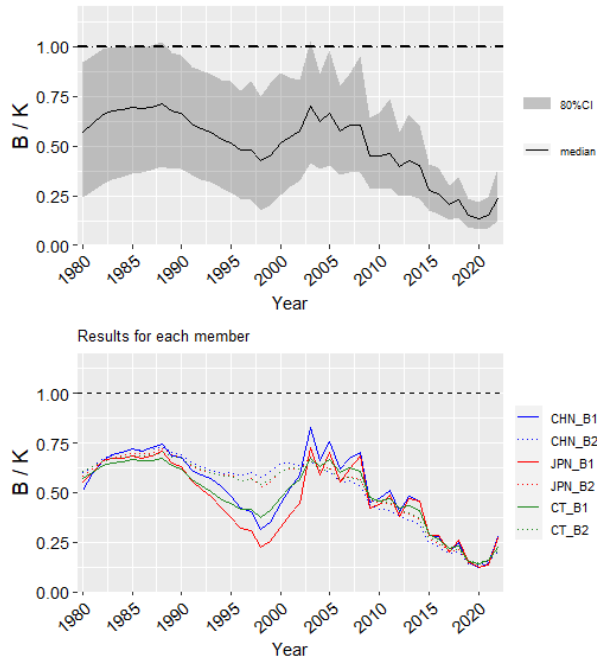


Figure 3 (Continued).

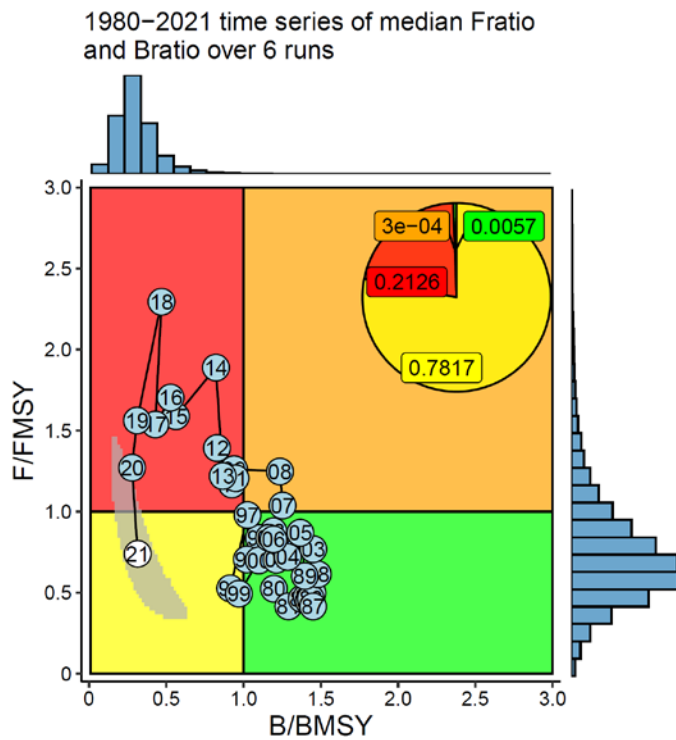


Figure 4. Kobe plot with time trajectory. The data are aggregated across 6 model results (2 base-case models by 3 Members).

Current stock condition and management advice

Summary of stock status

Results of combined model estimates indicate that the stock declined with an interannual variability from near carrying capacity in the mid-2000's after a period of high productivity to current low levels. The results also indicated that B was below B_{MSY} (median average B/B_{MSY} during 2020-2022 = 0.368, 80%CI=0.232-0.564) and F was above F_{MSY} (average F/F_{MSY} during 2019-2021 = 1.192, 80%CI= 0.757-1.883). The results further indicated that recent stock biomass remains at a historically low level in recent years. The biomass trend shows a small increase in recent years through 2021 and a marked increase in the Japanese biomass survey between 2021 and 2022. The harvest rate has also been declining from a peak in 2018 and was less than F_{MSY} during 2021. However, caution is required in interpreting these results, given historically low nominal CPUEs (see Fig. 5) through 2022, relatively high fishing effort in 2021, and variability inherent in fisheries-independent surveys.

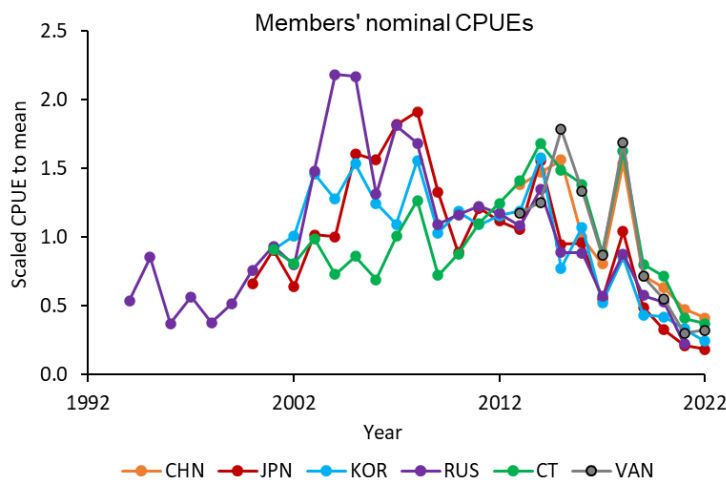


Figure 5. Time series of Member's nominal CPUE indices. Data in 2022 are preliminary (as of November 2022).

Robustness to scale uncertainty

Retrospective analyses for base case models in this assessment show considerable scale uncertainty with the magnitude (but not trend) of biomass and fishing mortality estimates changing substantially in some models as the terminal year in the model was reduced sequentially from 2022 to 2018. Members agreed that there was little or no retrospective pattern in trend because the overall trends in biomass and fishing mortality were relatively consistent (see Figure 3). Poor retrospective patterns estimate dramatic changes in recent trends when the terminal year is changed, as demonstrated in Figure 6 showing retrospective patterns for other species. However, the scale uncertainty surprised some Members and was a concern because unscaled biomass estimates are used in TAC calculations. It also seemed possible that uncertain scale in biomass estimates would make TAC calculations uncertain and affect conclusions about stock biomass and fishing mortality. Ensuing discussion and some calculations led the group to conclude that TAC advice based on BSSPM results are relatively unaffected by scale uncertainty.

Scale uncertainty is common in stock assessment modeling based on forward projecting models like the BSSPM that do not converge to stable historical biomass levels. Scale uncertainty is exacerbated for Pacific saury because the model is biomass based (so that mortality and growth are confounded), there are only two age groups, age zero saury are not fully selected by either the survey or fishery, and growth and natural mortality change rapidly. Scale uncertainty for Pacific saury is probably inevitable until reliable estimates of survey selectivity are developed. A new age-structured assessment model currently under development may help as well.

Stock status for Pacific saury in this assessment based on the BSSPM model is described in terms of robust biomass and fishing mortality ratio trends to avoid problems with scale uncertainty. The biomass ratio B/B_{MSY} can be expressed as true B times an error divided by true B_{MSY} times an error. The two errors tend to be similar

and cancel in the ratio so that B/B_{MSY} and true $B/\text{true } B_{MSY}$ are similar, and the status measure is robust. The tendency to robust trend estimation has always been evident in Pacific saury assessments because the trends estimated in models fit by members with different assumptions tend to be similar. The robustness property applies to Kobe plots and similar means for status determination because the comparison is F/F_{MSY} to F_{MSY} and B/B_{MSY} to B_{MSY} .

TAC calculations like $TAC = F_{MSY} * B$ are robust to scale uncertainty because errors in estimates of productivity and biomass tend to cancel in the product of F_{MSY} and B . In practical terms, scale uncertainty means that assessment scientists cannot determine if the stock is larger and less productive or smaller and more productive. Fishing mortality and productivity are related in simple Schaefer surplus production models because $F_{MSY} = r/2$ where r is the intrinsic rate of productivity which is the maximum rate of population growth. Reported catch $C = F * B$ is not affected by scale uncertainty. If the estimated biomass estimates are too large, then the model must underestimate fishing mortality and productivity to obtain the observed catch, so the stock appears to be relatively large and unproductive. Similarly, if the estimated biomass is too small, then the model must overestimate fishing mortality and productivity so that the stock appears to be smaller and more productive.

The over (or under) estimation of biomass tends to be cancelled out by an under (or over) estimation of F_{MSY} . The SSC PS demonstrated this pattern by calculating $TAC = F_{MSY} * B$ based on estimates from two base models by three Member. The TAC results were more similar than the original biomass estimates, which had substantially different scales (Table 3). TAC calculated from any harvest control rule based on F_{MSY} (e.g. with the target F reduced when $B/B_{MSY} < 1$) should also be robust.

Robust trend estimation and robust TAC calculations based on model biomass estimates are not related to predicting future trends in the Pacific saury fishery. Robust properties to scale uncertainty do not alleviate any other problems that may exist in the model. Rather, robust means that similar results will be obtained from results with different scales.

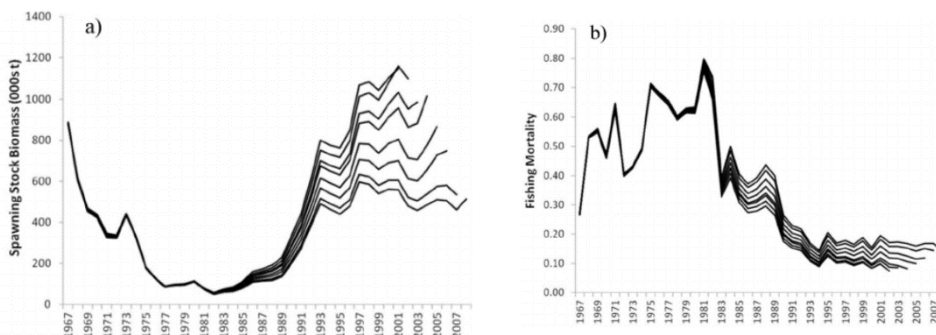


Figure 6. Retrospective patterns in stock assessment results (not Pacific saury).

Management advice

The Commission has responsibility for choosing the TAC and the TAC approach for the Pacific saury fishery. The method used by the Commission in 2019 to set the 2020 TAC for saury was $F_{MSY} * B$, which is a standard approach used previously in many fisheries. However, it was noted in the last assessment that the original method is seldom used in modern fishery management because it maintains a high (F_{MSY}) fishing mortality level as stock biomass becomes low, as is currently the case for Pacific saury. Simulation studies for many fisheries show better performance (higher average catch and less frequent low biomass conditions) using harvest control rules such as a new standard approach now used in many fisheries. The newer standard reduces fishing mortality in a simple linear fashion when stock size falls below B_{MSY} to help rebuild stocks at low biomass and increase catches (Figure 7). It gives the same F and same TAC for stocks at biomass levels B_{MSY} and higher (the original and new approaches are identical when stock biomass is at least B_{MSY}). The new approach is generally regarded as better on technical grounds at maintaining productive stock levels, avoiding low biomass conditions and obtaining relatively high long-term catch. Both approaches are based on the same underlying reference points (F_{MSY} and B_{MSY}) that are estimable for Pacific saury in the BSSPM and likely future models. Both approaches use robust trend-based stock status measures and reference points.

TAC calculations were carried out in this assessment for illustrative purposes using the original and newer standard approaches. Such calculations may serve as a means for communication between scientists and managers, provide another approach to calculate TAC on an interim manner, or as a basis for further work. Results show that the newer approach results in TAC for 2023 (101,885 tons) that is close to the 2022 catch (98,000 tons, preliminary as of 17 December 2022) and better matches current surplus production in the stock. Results for the original approach yield TAC for 2023 (205,015 tons), which is substantially higher than recent catches.

The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) based on historical catch is much larger than a TAC that would be based on the F_{MSY} catch approach ($B_{2022} * F_{MSY} = 205,015$ tons). The current biomass is much lower than B_{MSY} and the TAC for 2021-2022 did not reduce fishing mortality in recent years. A harvest control rule that reduces F when biomass is low may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 403,000 tons). A reduction to the TAC for 2021-2022 would increase the probability of higher biomass and catch levels in the Pacific saury stock.

An HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world. For example, if an HCR that reduces F linearly when biomass is below B_{MSY} (Figure 8) is applied, the TAC calculated based on such an HCR ($B_{2022} * F_{MSY} * (B_{2022} / B_{MSY}) = 101,885$ tons) could be similar with the current catch (98,000 tons, preliminary as of 17 December 2022).

Note, however, the performance of the above HCRs has not been evaluated by a formal MSE framework for Pacific saury. They were used as simple illustrations of common approaches used elsewhere.

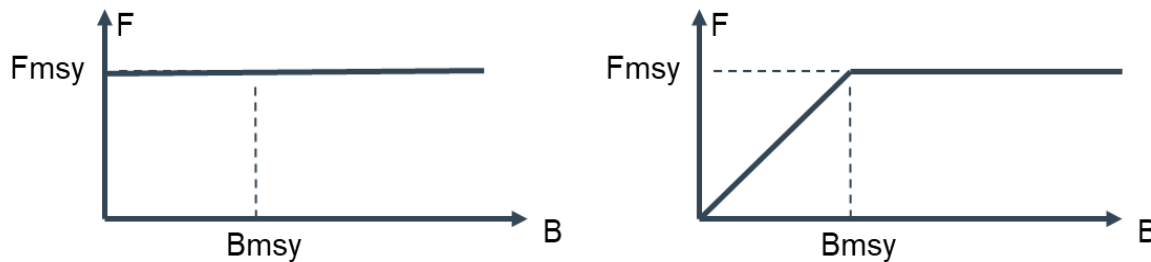


Figure 7. Shapes of harvest rates used in the 2019 Commission meeting for setting the TAC for 2020 (left) and a standard HCR (right).

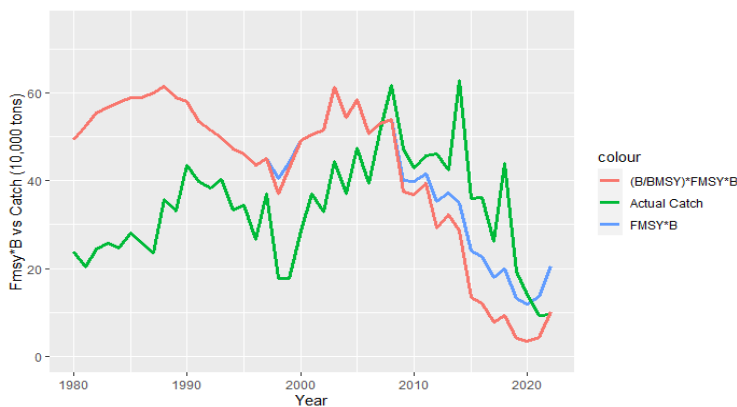


Figure 8. Median time series of $F_{MSY} * B$, $\min(1, B/B_{MSY}) * F_{MSY} * B$, and the actual catch. The first calculation was used by the Commission in 2019 and the second calculation is a common HCR used elsewhere that reduces F when biomass falls below B_{MSY} . Note that the catch in 2022 is a preliminary number as of 17 December 2022. Note that these two calculations are the same when $B > B_{MSY}$. Also the second calculation is shown as an example application of an HCR.

The HCR used in the second calculation above is a relatively simple approach widely used in many fisheries, but only one example from the range of potential harvest control rules of the same or other types. The SWG MSE PS is currently evaluating options that would work well for short lived Pacific saury.

Table 3. Summary of results for application of TAC calculations as an example manner.

	Base case 1			Base case 2			Aggregated over 6 runs
	CHN	JP	CT	CHN	JP	CT	
Fmsy	0.49	0.52	0.25	0.21	0.26	0.16	0.313
B2022	51.78	46.5	72.59	79.17	74.8	95.12	65.5
B2022/Bmsy (=c)	0.57	0.58	0.46	0.42	0.48	0.43	0.494
Fmsy*B2022	25.37	24.18	18.15	16.63	19.45	15.22	20.50
c*Fmsy*B2022	14.46	14.02	8.35	6.98	9.34	6.54	10.13

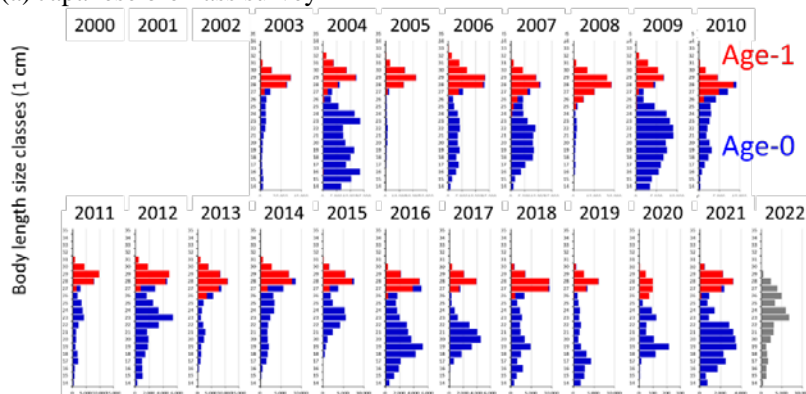
Special comments regarding the procedures and stock assessment results

The SSC PS worked collaboratively to produce this consensus stock assessment, which includes significant technical improvements.

- 1) Standardized CPUE data were assumed to change more slowly than biomass and were down-weighted relative to the Japanese survey in the first base case (B1), which used CPUE from individual Members. In B1, a single non-linear parameter was used for the CPUEs for each Member. Model results support this decision.
- 2) Retrospective analyses have shown that BSSPM model projections are not suitable for use by managers and they have therefore been omitted by most Members (See discussion in the 2019 assessment (NPFC-2019-SSC PS04-Final Report)). Projections are problematic because recruits and older Pacific saury are not distinguished in the model, environmental effects are important but not predictable and because the species is short-lived.
- 3) The 2020 biomass index from the Japanese survey has large uncertainties due to incomplete survey coverage. Potential Covid-19 effects on CPUE and catches were not considered in this assessment but may be important. Members should consult fishermen regarding possible impacts of COVID-19 on the fishery.
- 4) The relative importance of fishing and environmental factors on the population dynamics of Pacific saury is unknown and an important area for research. However, changing environmental conditions may have contributed to the decline and current low stock size of Pacific saury. However oceanographic or biological factors responsible for changes in productivity have not yet been determined. Development of modeling procedures to incorporate environmental change is an important area for future research. The work should include refinements to stock assessment models to better reflect and estimate environmental effects on recruitment and biology. This work should be coordinated among Members and folded into the development of age-structured and improved BSSPM models.
- 5) The Commission should consider defining overfishing and overfished status and identify actions taken when such conditions occur in the future.
- 6) In the next assessment, the geographic area to which data and assessment estimates apply (Convention Area, Members' EEZ or both) should be described.
- 7) Nominal CPUE trends (Figure 5) and standardized CPUEs (Figure 2) used in assessment modeling were similar. Preliminary catch (around 98,000 mt as of 17 December 2022) and preliminary nominal CPUE in 2022 for each Member were at the lowest levels historically. CPUE declines more slowly than stock biomass as demonstrated in all BSSPM results for Pacific saury. Thus, the decline in stock biomass was probably greater than the decline in CPUE.

- 8) Time series of size and age composition data from the Japanese survey and fishery (Figures 9 and 10) showed the occurrence of weak year classes (i.e. 2005, 2008) consistently. Such consistency will facilitate application of new age and/or size structured model.

(a) Japanese biomass survey



(b) Japanese commercial fishery between August and November

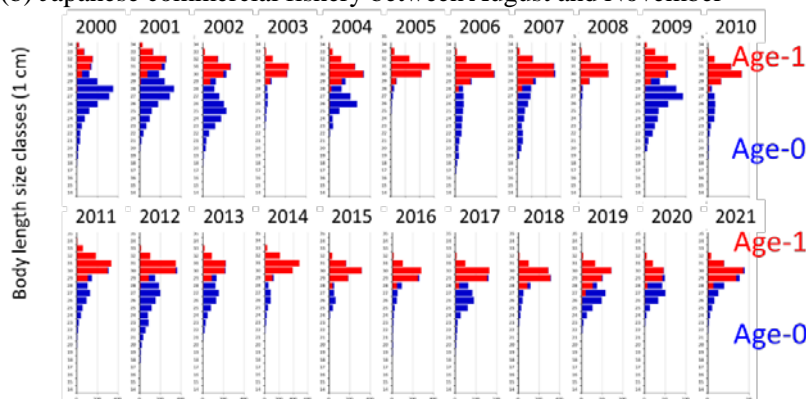


Figure 9. Time series of age and length composition of samples taken from the Japanese survey and commercial fishery (August-November) in Japan.

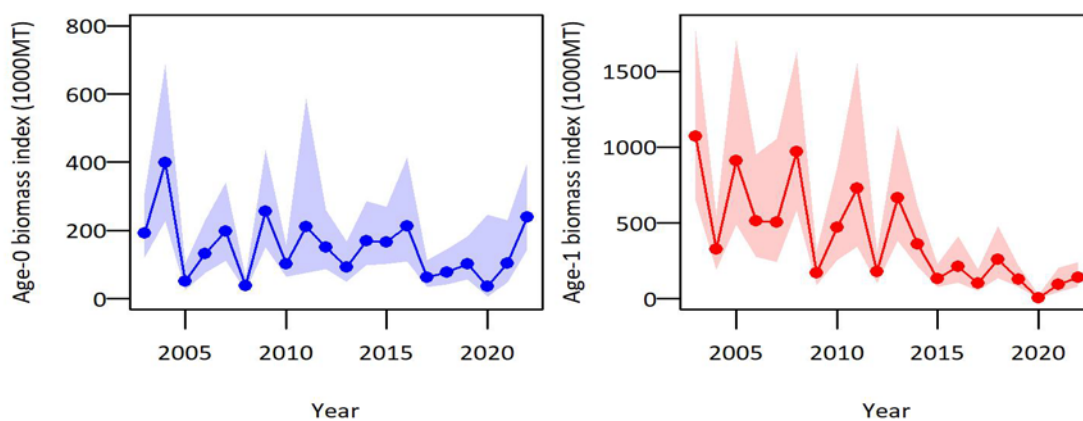


Figure 10. Time series of Japanese survey biomass index by age.

- 9) In this assessment, trends in effective annual fishing effort were calculated as catch divided by standardized CPUE (nominal CPUE was used for Vanuatu because standardized CPUE was not available, Figure 11). Standardized CPUE is theoretically the catch rate for a single type of vessel operating across the range of the fishery during the fishing season. $\text{Standardized CPUE} = \text{catch} / \text{standardized fishing effort}$ so

standardized fishing effort = catch / standardized CPUE. Thus, the effort calculation measures the amount of fishing effort theoretically required for a representative type of vessel in each year to take the observed catch. Results for the entire fishery show that effort increased beginning in 1994 and has been variable and relatively high since about 2000 despite strong trends in fishing effort by individual members. In particular, declines in Japanese and Russian fishing effort have been offset by increases in fishing effort by China since 2015, Korea since 2011, Chinese Taipei since 2001 and, to a lesser extent, Vanuatu since 2011.

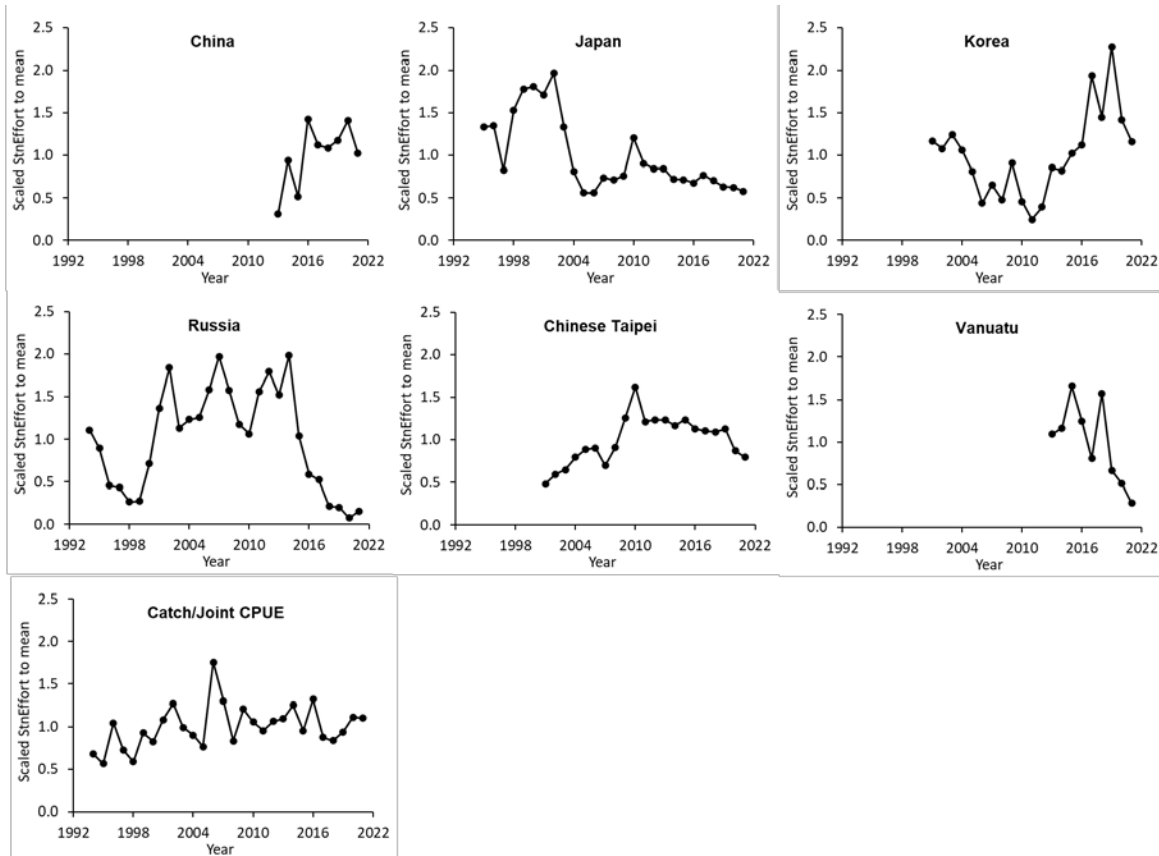


Figure 11. Time series of standardized efforts for the total fishery and Members' fishery calculated by a simple formula of Catch/standardized CPUE. Note that the effort for Vanuatu is the nominal effort.

STOCK ASSESSMENT REPORT FOR PACIFIC SAURY

1. INTRODUCTION

1.1 Distribution

Pacific saury (*Cololabis saira* Brevoort, 1856) has a wide distribution extending in the subarctic and subtropical North Pacific Ocean from inshore waters of Japan and the Kuril Islands to eastward to the Gulf of Alaska and southward to Mexico. Pacific saury is a commercially important fish in the western North Pacific Ocean (Parin 1968; Hubbs and Wisner 1980).

1.2 Migration

Pacific saury migrates extensively between the northern feeding grounds in the Oyashio waters around Hokkaido and the Kuril Islands in summer and the spawning areas in the Kuroshio waters off southern Japan in winter (Fukushima 1979; Kosaka 2000). Pacific saury in offshore regions (east of 160°E) also migrate westward toward

the coast of Japan after October every year (Suyama et al. 2012).

1.3 Population structure

Genetic evidence suggests there are no distinct stocks in the Pacific saury population based on 141 individuals collected from five distant locales (East China Sea, Sea of Okhotsk, northwest Pacific, central North Pacific, and northeast Pacific) (Chow et al. 2009).

1.4 Spawning season and grounds

The spawning season of Pacific saury is relatively long, beginning in September and ending in June of the following year (Watanabe and Lo 1989). Pacific saury spawns over a vast area from the Japanese coastal waters to eastern offshore waters (Baitaliuk et al. 2013). The main spawning grounds are considered to be located in the Kuroshio-Oyashio transition region in fall and spring and in the Kuroshio waters and the Kuroshio Extension waters in winter (Watanabe and Lo 1989).

1.5 Food and feeding

The Pacific saury larvae prey on the nauplii of copepods and other small-sized zooplankton. As they grow, they begin to prey on larger zooplankton such as krill (Odate 1977). The Pacific saury is preyed on by large fish ranked higher in the food chain, such as *Thunnus alalunga* (Nihira 1988) and coho salmon, *Oncorhynchus kisutch* (Sato and Hirakawa 1976) as well as by animals such as minke whales *Balaenoptera acutorostrata* (Konishi et al. 2009) and sea birds (Ogi 1984).

1.6 Age and growth

Based on analysis of daily otolith increments, Pacific saury reaches approximately 20 cm in knob length (distance from the tip of lower jaw to the posterior end of the muscular knob at the base of a caudal peduncle; hereafter as body length) in 6 or 7 months after hatching (Watanabe et al. 1988; Suyama et al. 1992). There is some variation in growth rate depending on the hatching month during this long spawning season (Kurita et al. 2004) and geographical differences (Suyama et al. 2012b). The maximum lifespan is 2 years (Suyama et al. 2006). The age 1 fish grow to over 27 cm in body length in June and July when Japanese research surveys are conducted and reach over 29 cm in the fishing season between August and December (Suyama et al. 2006).

1.7 Reproduction

The minimum size of maturity of Pacific saury has been estimated at about 25 cm in the field (Hatanaka 1956) or rearing experiments (Nakaya et al. 2010). In rare cases, saury have been found to mature at 22 cm (Sugama 1957; Hotta 1960). Under rearing experiments, Pacific saury begins spawning 8 months after hatching, and spawning activity continues for about 3 months (Suyama et al. 2016). Batch fecundity is about 1,000 to 3,000 eggs per saury (Kosaka 2000).

2. FISHERY

2.1 Overview of fisheries

Western North Pacific

In Japan, the stick-held dip net fishery for Pacific saury was developed in the 1940s. Since then, the stick-held dip net gears have become the dominant fishing technique to catch Pacific saury in the northwest Pacific Ocean. Since 1995, more than 97% of Japan's total catch is caught by the stick-held dip net. The annual catch of Pacific saury for stick-held dip net fishery has fluctuated. Maximum and minimum catches of 355 thousand tons and 30 thousand tons were recorded in 2008 and 2020, respectively.

Pacific saury fisheries in Korea have been operated with gillnet since the late 1950s in Tsushima Warm Current region. Korean stick-held dip net fishery started from 1985 in the Northwest Pacific Ocean. The largest catch of 50 thousand tons was recorded in 1997 (Gong and Suh 2013).

Russian fishery for Pacific saury has been conducted using stick-held dip nets in the northwest Pacific Ocean in the area that includes national waters (mainly within the Russian EEZ) and adjacent NPFC Convention Areas. Russian catch statistics for saury fishery exists, beginning from 1956, and standardized CPUE indices from that fishery were calculated since 1994. Saury fishery traditionally occurred from August to November; however, in recent years, the onset of fishing for saury shifted to the early summer period. Peak catch of saury of over 100 thousand tons was in 2007. Since then, the annual catch has been decreasing, and was about 2.4 thousand tons in 2019 and about 750 tons in 2020.

China commenced its exploratory saury fishing using stick-held dip nets in the high seas in 2003, but only started to develop this fishery in 2012. The fishing seasons mainly cover the period from June-November.

Chinese Taipei's Pacific saury fishery can date back to 1975 and had its first commercial catch in 1977. Over the past decade, the number of active Pacific saury fishing vessels has been increasing from 68 to 91 and the catch has fluctuated between 39,750 tons and 229,937 tons since 2001. Aside from Pacific saury fishery, most of the Pacific saury fishing vessels also conduct flying squid jigging operations in the Northwest Pacific Ocean.

Vanuatu commenced its development of Pacific saury fishery by using stick-held dip net in the high seas in 2004. Currently there are four vessels operating in the Northwest Pacific targeting saury, but the total accumulative number of its authorized Pacific saury fishing vessels from 2004 to 2020 is 16. The fishing season mainly covers the period from July to November each year.

Eastern North Pacific

Although Pacific saury occur in the Canada EEZ, there is no targeted fishery for the species. There is no historical record of Canadian participation in international fisheries for saury. Domestic fisheries sometimes capture saury as bycatch in pelagic and bottom trawls and there are a handful of records from other gear types including commercial longlines. The most recently compiled estimates indicate around 300 kg of saury were captured by Canadian commercial fisheries over 17 years from 1997-2013 (Wade and Curtis 2015; NPFC-2022-SSC PS09-IP01). There are also records of saury catches from research trawls (surface, pelagic and bottom trawls) in Canadian waters, but the catches have been minimal.

Management plans developed by the United States' National Marine Fisheries Service currently prohibit targeted fishing on marine forage species including the Pacific saury. In the 1950's to mid-1970's there were sporadic attempts to commercially fish for Pacific saury off of California with limited success using purse seines and light attraction (Kato 1992). Catches from 1969-1972 averaged 450 tons. Currently landings are only "occasionally" reported as bycatch in fisheries on the US west coast. Landings of Pacific saury as bycatch on the US west coast averaged 5.5 kg per year from 2011-2015 (NOAA Fisheries National Bycatch Report Database System, <https://www.st.nmfs.noaa.gov/>, accessed March 8, 2019)

Historically, Japanese and Russian vessels operated mainly within their own EEZs, but they have shifted into the Convention Area in recent years. Chinese, Korean and Chinese Taipei vessels operate mainly in the high seas of the North Pacific (Figure 1).

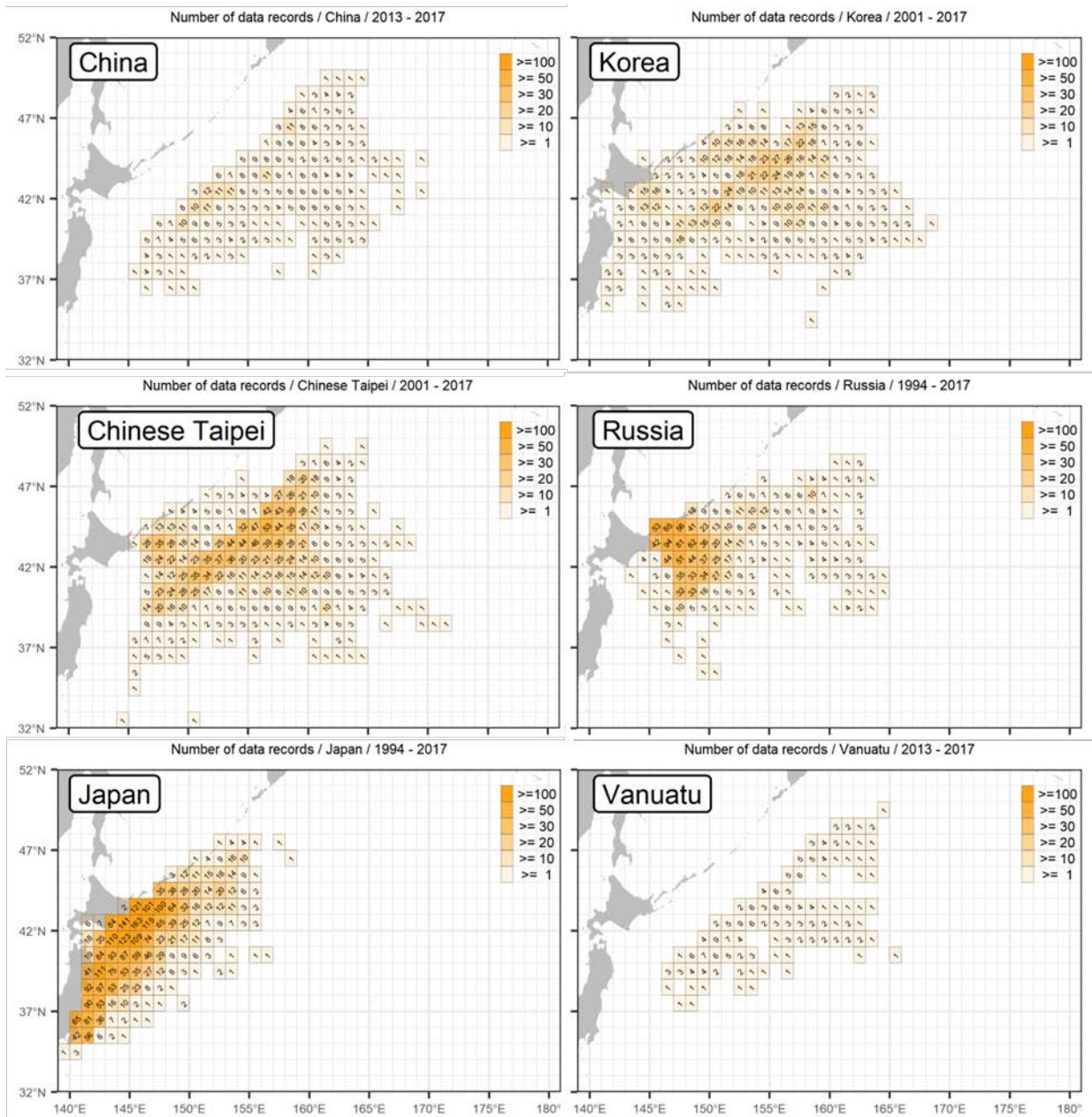


Figure 1 (a). Main fishing grounds for Pacific saury by fishing members in the western North Pacific Ocean during 1994-2017. The legend shows the number of data records. This figure is based on the data shared by the Members for the development of a joint CPUE index

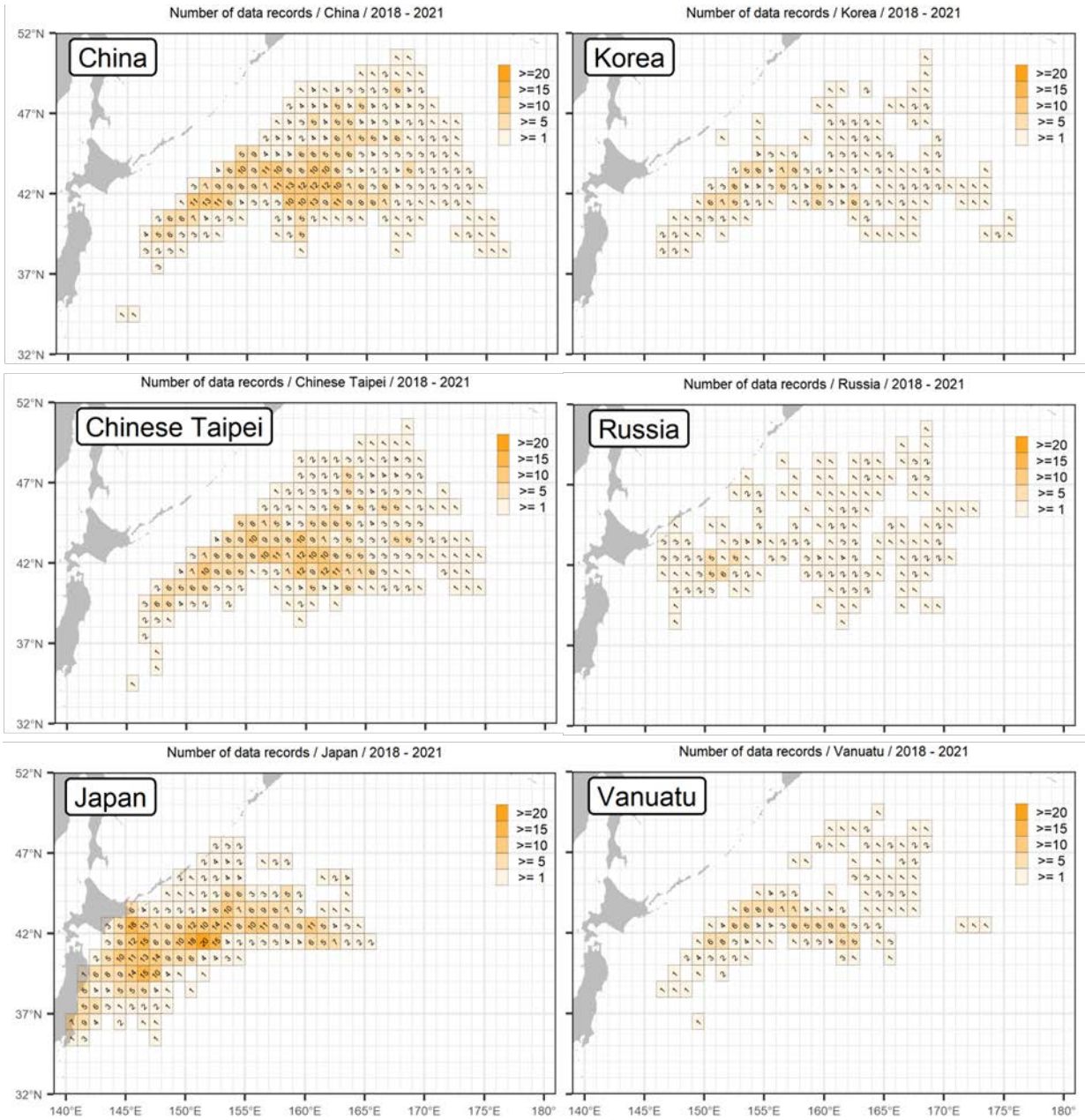


Figure 1 (b). Main fishing grounds for Pacific saury by fishing members in the western North Pacific Ocean during 2018-2021. The legend shows the number of data records. This figure is based on the data shared by the Members for the development of a joint CPUE index

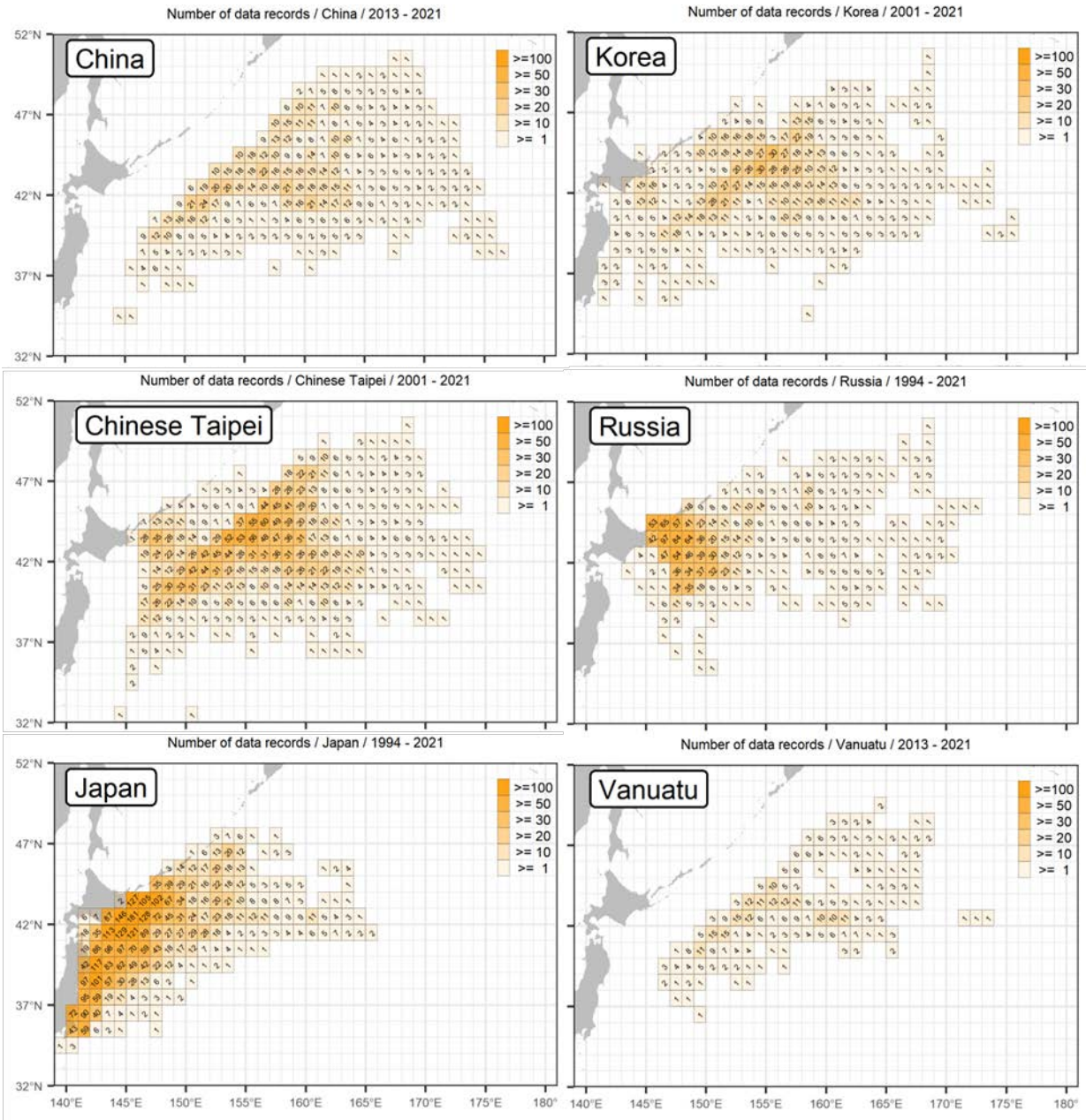


Figure 1 (c). Main fishing grounds for Pacific saury by fishing members in the western North Pacific Ocean during 1994-2021. The legend shows the number of data records. This figure is based on the data shared by the Members for the development of a joint CPUE index

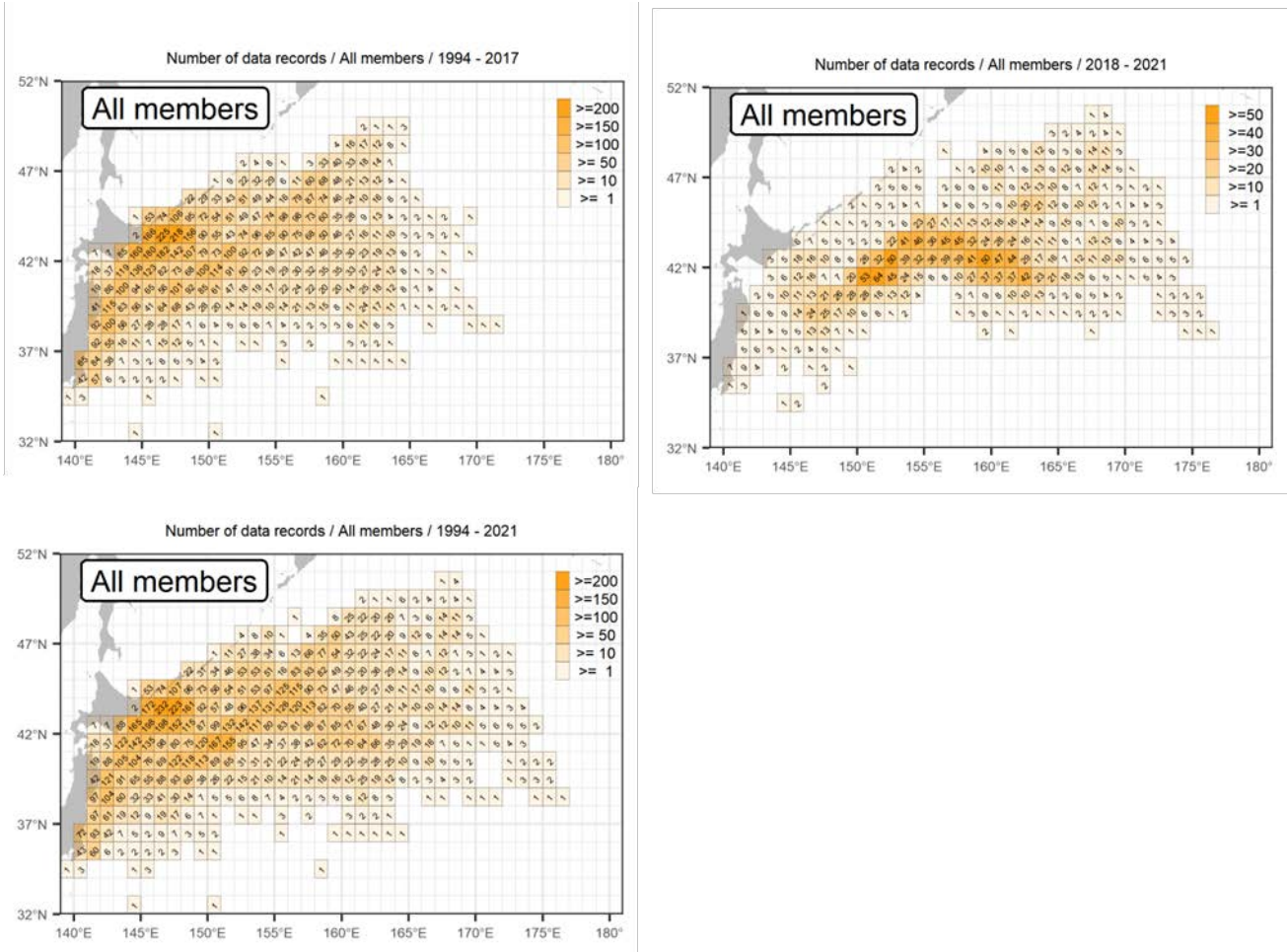


Figure 1 (d). Main fishing grounds for Pacific saury in the western North Pacific Ocean. The legend shows the number of data records. This figure is based on the data shared by the Members for the development of a joint CPUE index

2.2 Catch records

Figure 2 shows the historical catches of Pacific saury in the northwest Pacific Ocean by Member.

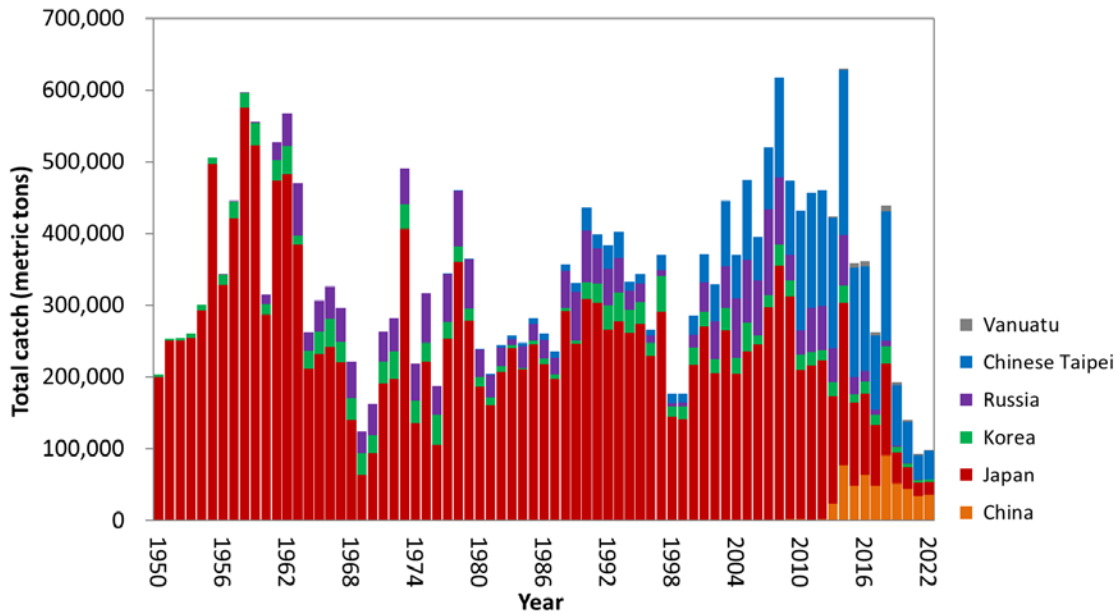


Figure 2. Time series of catch by Member during 1950-2022. The catch data for 1950-1979 are shown but not used in stock assessment modeling. Catch data in 2022 are preliminary (as of 17 December 2022) and not used in the assessment.

3. SPECIFICATION OF STOCK ASSESSMENT

A Bayesian state-space production model (BSSPM) used in previous stock assessments was employed as an agreed provisional stock assessment model for Pacific saury during 1980-2022. Scientists from three Members (China, Japan and Chinese Taipei) each conducted analyses following the agreed specification which called for two base case scenarios and two sensitivity scenarios (see Annex F, SSC PS09 report for more details). The two base case scenarios differ in using each Member's standardized CPUEs (base case B1) or standardized joint CPUEs (base case B2). For the two sensitivity cases with Japanese early CPUE (1980-1994), time-varying catchability was assumed to account for potential increases in catchability. A higher weight was given to the Japanese biomass survey estimates than to Members' CPUEs in B1 while comparable weights were given to the Japanese biomass survey estimates and the joint CPUEs in B2. The CPUE data were modeled as nonlinear indices of biomass. Members used similar approaches with some differences in the assumption of the time-varying catchability and prior distributions for the free parameters in the model.

3.1 Bayesian state-space production model

The population dynamics is modelled by the following equations:

$$B_t = \{B_{t-1} + B_{t-1}f(B_{t-1}) - C_{t-1}\}e^{u_t}, \quad u_t \sim N(0, \tau^2)$$

$$f(B_t) = r \left[1 - \left(\frac{B_t}{K} \right)^z \right]$$

where

B_t : the biomass at the beginning of year t

C_t : the total catch of year t

u_t : the process error in year t

$f(B)$: the production function (Pella-Tomlinson)

r : the intrinsic rate of natural increase

K : the carrying capacity

z : the degree of compensation (shape parameter; different symbols were used by the 3 members)

The multiple biomass indices are modelled as follows:

Survey biomass estimate

$$I_{t,biomass} = q_{biomass} B_t \exp(v_{t,biomass}), \quad \text{where } v_{t,biomass} \sim N(0, \sigma_{biomass}^2)$$

where

$q_{biomass}$: the relative bias in biomass estimate

$v_{t,biomass}$: the observation error term in year t for survey biomass estimate

$\sigma_{biomass}^2$: the observation error variance for survey biomass estimate

CPUE series

$$I_{t,f} = q_f B_t^b \exp(v_{t,f}), \quad \text{where } v_{t,f} \sim N(0, \sigma_f^2)$$

where

$I_{t,f}$: the biomass index in year t for biomass index f

q_f : the catchability coefficient for biomass index f

b : the hyper-stability/depletion parameter

$v_{t,f}$: the observation error term in year t for biomass index f

σ_f^2 : the observation error in year t for biomass index f

For the estimation of parameters, Bayesian methods were used with Member-specific differences in preferred assumptions for the prior distributions for the free parameters. MCMC methods were employed for simulating the posterior distributions. For the assumptions of uniform priors used in China and Japan, see documents NPFC-2020-SSC PS06-WP08 and NPFC-2020-SSC PS06-WP10; for the non-uniform priors used in Chinese Taipei, see document NPFC-2020-SSC PS06-WP17.

3.2 Agreed scenarios

Table 1. Definition of scenarios

	Base case (NB1)	Base case (NB2)	Sensitivity case (NS1)	Sensitivity case (NS2)
Initial year	1980	1980	1980	1980
Biomass survey	$I_{t,bio} = q_{bio} B_t e^{v_{t,bio}}$ $v_{t,bio} \sim N(0, cv_{t,bio}^2 + \sigma^2)$ $q_{bio} \sim U(0,1)$ (2003-2022)	Same as left	Same as left	Same as left
CPUE	CHN(2013-2021) JPN_late(1994-2021) KOR(2001-2021) RUS(1994-2021) CT(2001-2021) $I_{t,f} = q_f B_t^b e^{v_{t,f}}$ $v_{t,f} \sim N(0, \sigma_f^2)$ $\sigma_f^2 = c \cdot (ave(cv_{t,bio}^2) + \sigma^2)$, where $ave(cv_{t,bio}^2)$ is computed except for 2020 survey ($c = 5$)	Joint CPUE (1994-2021) $I_{t,joint} = q_{joint} B_t^b e^{v_{t,joint}}$ $v_{t,joint} \sim N(0, cv_{t,joint}^2 + \sigma^2)$	CHN(2013-2021) JPN_early(1980-1993, time-varying q) JPN_late(1994-2021) KOR(2001-2021) RUS(1994-2021) CT(2001-2021) $I_{t,f} = q_f B_t^b e^{v_{t,f}}$ $v_{t,f} \sim N(0, \sigma_f^2)$ $\sigma_f^2 = c \cdot (ave(cv_{t,bio}^2) + \sigma^2)$, where $ave(cv_{t,bio}^2)$ is computed except for 2020 survey ($c = 6$)	JPN_early(1980-1993, time- varying q) $I_{t,JE} = q_{t,JE} B_t^b e^{v_{t,JE}}$ $v_{t,JE} \sim N(0, \sigma_{JE}^2)$ $\sigma_{JE}^2 = c \cdot ave(cv_{t,joint}^2 + \sigma^2)$ Joint CPUE (1994-2021) $I_{t,joint} = q_{joint} B_t^b e^{v_{t,joint}}$ $v_{t,joint} \sim N(0, cv_{t,joint}^2 + \sigma^2)$
Hyper-depletion / stability	A common parameter for all fisheries with a prior distribution, $b \sim U(0, 1)$	$b \sim U(0, 1)$	A common parameter for all fisheries but JPN_early, with a prior distribution, $b \sim U(0, 1)$ [b for JPN_early is fixed at 1]	$b \sim U(0, 1)$ for joint CPUE. [b for JPN_early is fixed at 1]
Prior for other than q_{bio}	Own preferred options	Own preferred options	Own preferred options	Own preferred options

Table 2. Description of symbols used in the stock assessment

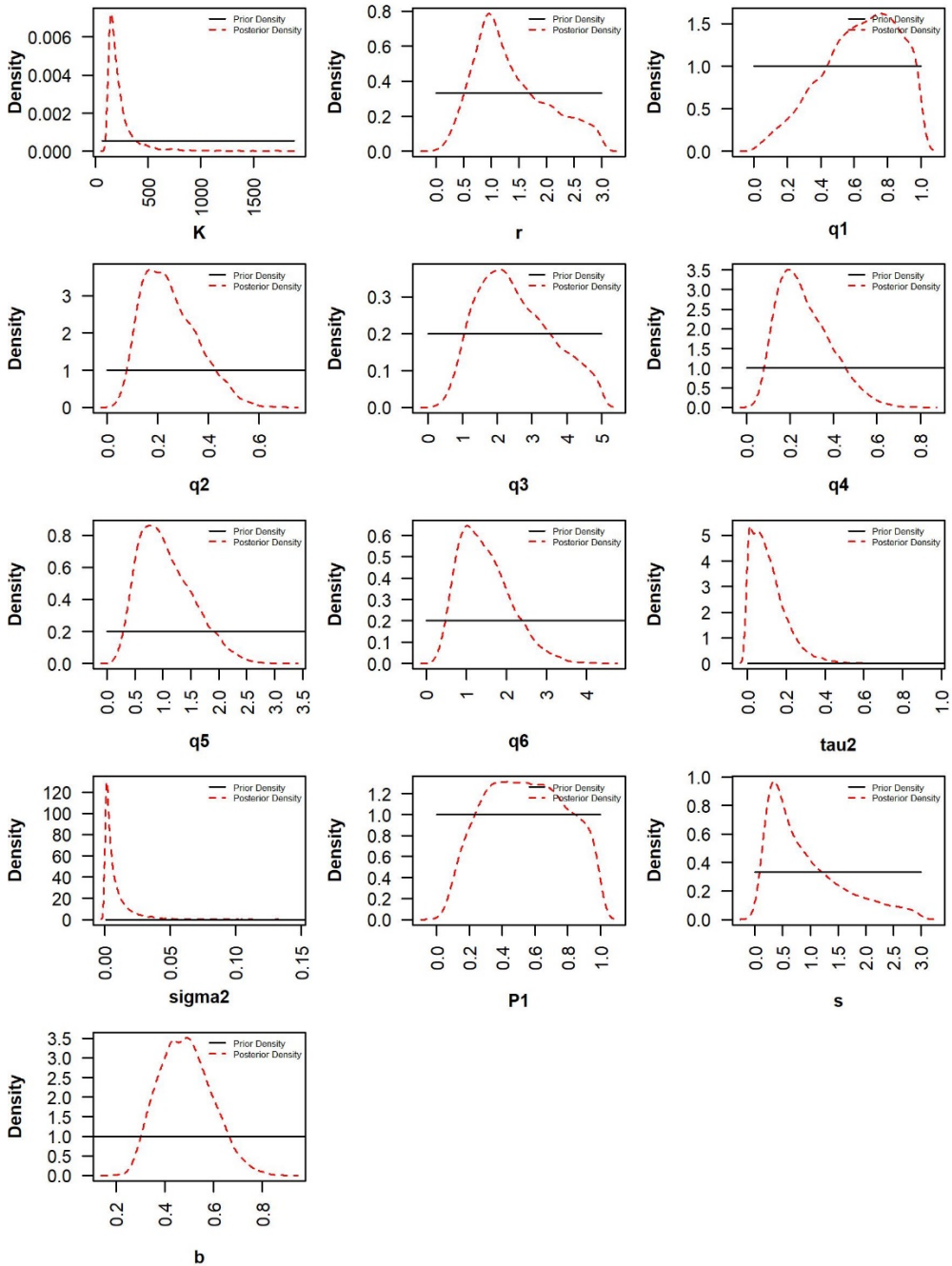
Symbol	Description
C_{2021}	Catch in 2021
$AveC_{2019-2021}$	Average catch for a recent period (2019–2021)
$AveF_{2019-2021}$	Average harvest rate for a recent period (2019–2021)
F_{2021}	Harvest rate in 2021
F_{MSY}	Annual harvest rate producing the maximum sustainable yield (MSY)
MSY	Equilibrium yield at F_{MSY}
F_{2021}/F_{MSY}	Average harvest rate in 2021 relative to F_{MSY}
$AveF_{2019-2021}/F_{MSY}$	Average harvest rate for a recent period (2019–2021) relative to F_{MSY}
K	Equilibrium unexploited biomass (carrying capacity)
B_{2021}	Stock biomass in 2021 estimated in the model
B_{2022}	Stock biomass in 2022 estimated in the model
$AveB_{2020-2022}$	Stock biomass for a recent period (2020–2022) estimated in the model
B_{MSY}	Stock biomass that will produce the maximum sustainable yield (MSY)
B_{MSY}/K	Stock biomass that produces the maximum sustainable yield (MSY) relative to the equilibrium unexploited biomass ^a
B_{2021}/K	Stock biomass in 2021 relative to K^a
B_{2022}/K	Stock biomass in 2022 relative to K^a
$B_{2020-2022}/K$	Stock biomass in the latest time period (2020–2022) relative to the equilibrium unexploited stock biomass ^a
B_{2021}/B_{MSY}	Stock biomass in 2021 relative to B_{MSY}^a
B_{2022}/B_{MSY}	Stock biomass in 2022 relative to B_{MSY}^a
$B_{2020-2022}/B_{MSY}$	Stock biomass for a recent period (2020–2022) relative to the stock biomass that produces maximum sustainable yield (MSY) ^a

^acalculated as the average of the ratios.

4. RESULTS by CHINA, JAPAN and CHINESE TAIPEI

4.1 CHINA

4.1.1 Prior and posterior distributions for Base case model 1 (as an illustrative example)

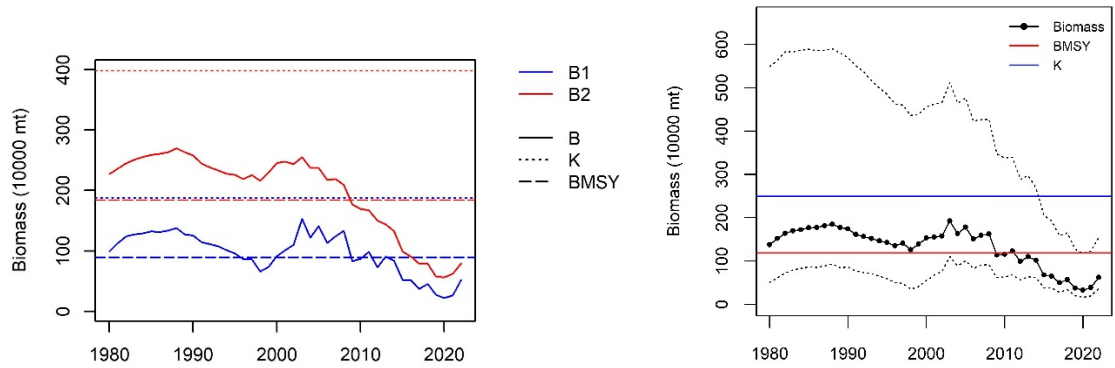


4.1.2 Summary of estimates of parameters and reference points

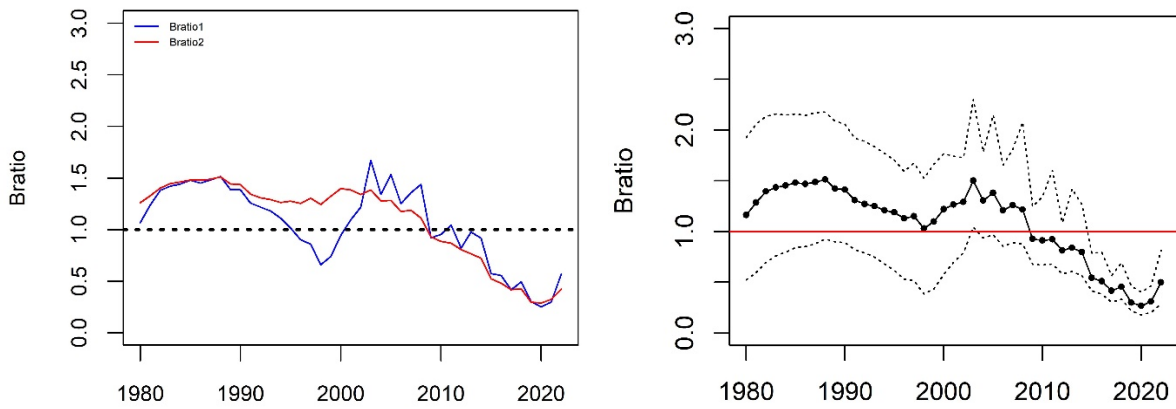
	Base case 1	Base case 2	Over all 2
C2021	9.22	9.22	9.22
AveC2019-2021	14.14	14.14	14.14
AveF2019-2021	0.57	0.24	0.40
F2021	0.35	0.15	0.24
F _{MSY}	0.49	0.21	0.36
MSY	43.89	38.11	41.32
F2021/F _{MSY}	0.71	0.76	0.73
AveF2019-2021/F _{MSY}	1.16	1.26	1.20
K	187.70	398.20	249.20
B2021	26.63	62.28	38.26
B2022	51.78	79.17	62.19
AveB2020-2022	33.74	66.36	44.85
B _{MSY}	89.28	184.10	118.80
B _{MSY} /K	0.47	0.46	0.46
B2021/K	0.14	0.15	0.15
B2022/K	0.28	0.20	0.24
B2020-2022/K	0.18	0.17	0.18
B2021/B _{MSY}	0.30	0.32	0.31
B2022/B _{MSY}	0.57	0.42	0.50
B2020-2022/B _{MSY}	0.38	0.35	0.36

4.1.3 Time series plots for base case models and aggregated results

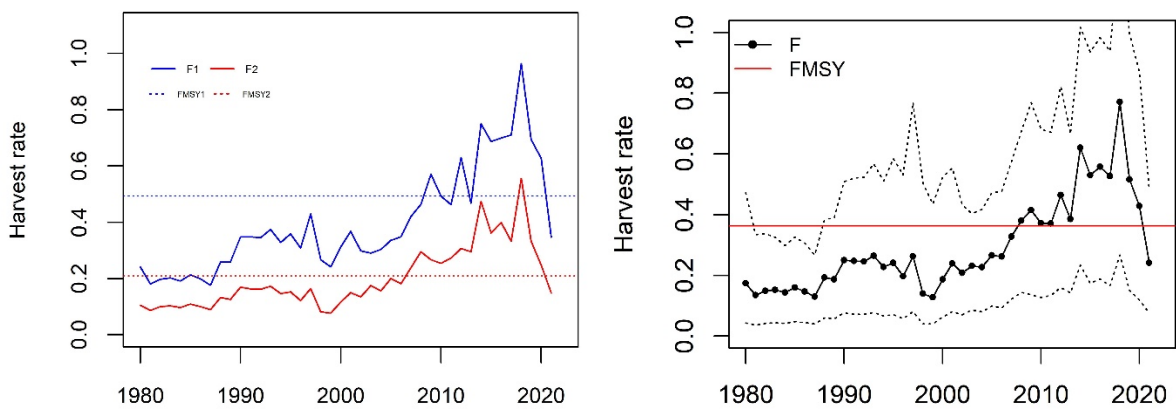
(a) Biomass



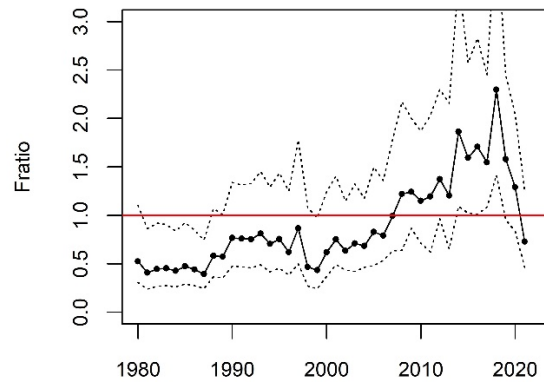
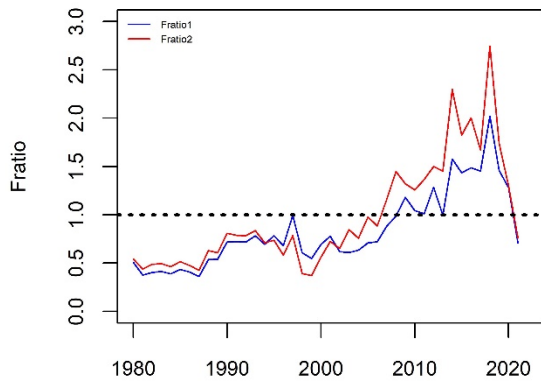
(b) B-ratio (B/B_{MSY})



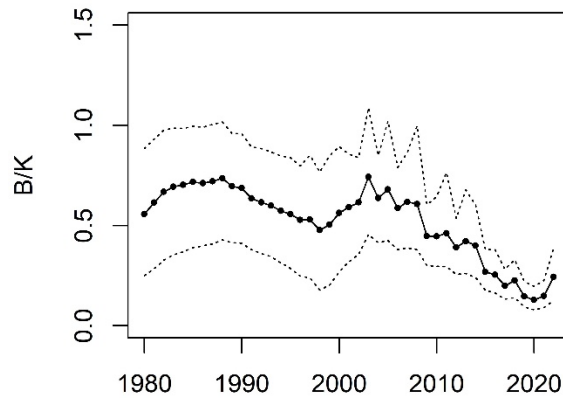
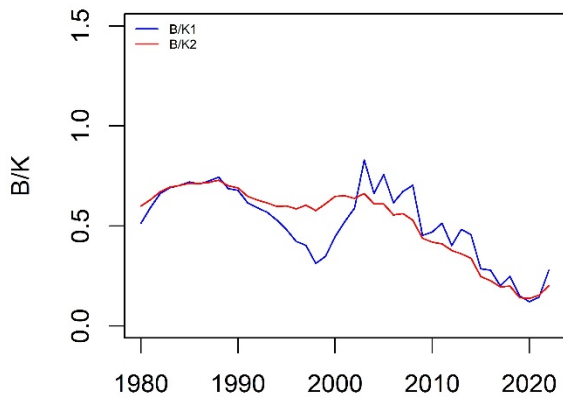
(c) Exploitation rate (F)



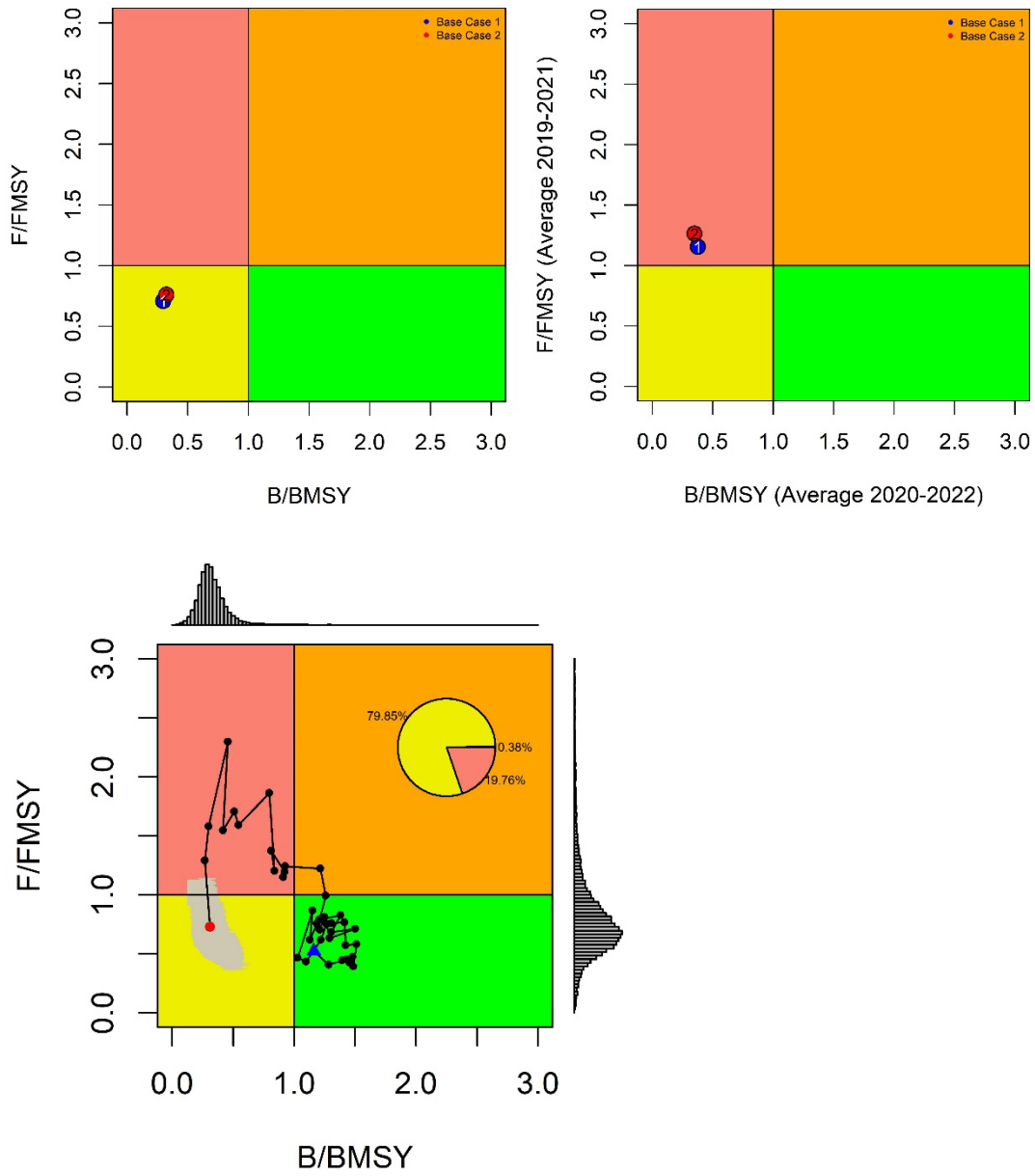
(d) F-ratio (F/F_{MSY})



(e) B/K

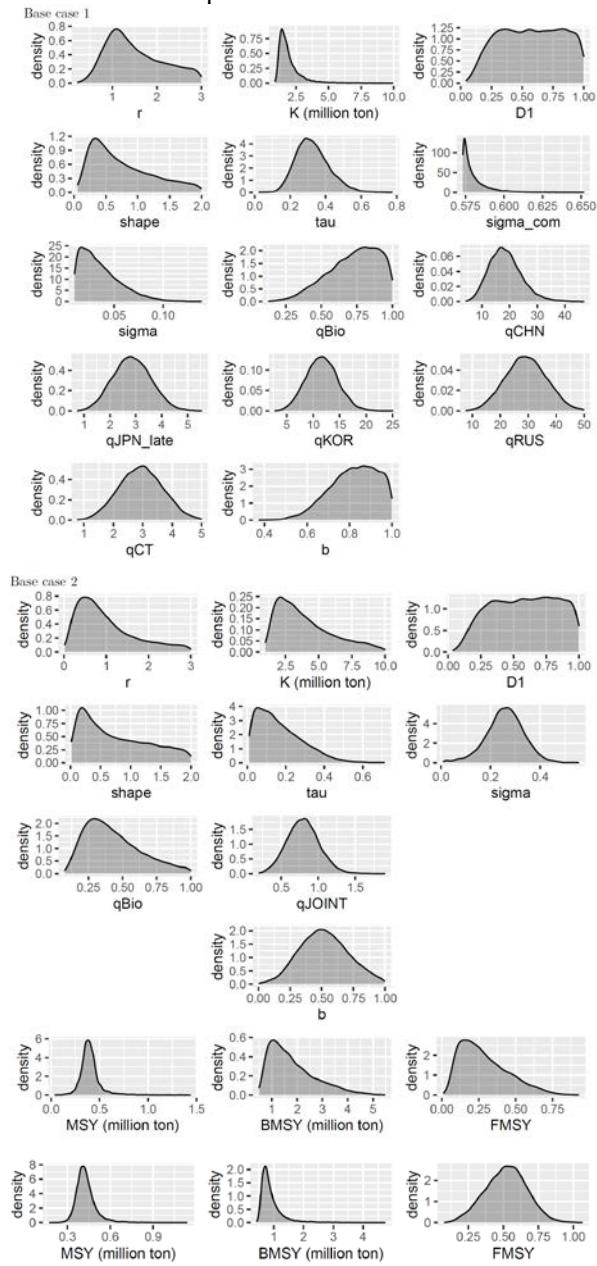


4.1.4 Kobe plots



4.2 JAPAN

4.2.1 Prior and posterior distributions for Base case models



Note: Prior for each free parameter is assumed to be uniform over the shown horizontal range.

4.2.2 Summary of estimates of parameters and reference points

Over the two base cases.

	Mean	Median	Lower10th	Upper10th
C_2020	0.140	0.140	0.140	0.140
AveC_2018_2020	0.257	0.257	0.257	0.257
AveF_2018_2020	0.526	0.515	0.290	0.775
F_2020	0.378	0.355	0.188	0.595
FMSY	0.368	0.357	0.179	0.563
MSY (million ton)	0.415	0.405	0.339	0.498
F_2020/FMSY	1.097	1.033	0.641	1.625
AveF_2018_2020/FMSY	1.543	1.480	0.973	2.187
K (million ton)	2.915	2.421	1.548	4.949
B_2020 (million ton)	0.455	0.393	0.235	0.742
B_2021 (million ton)	0.545	0.480	0.284	0.868
AveB_2019_2021	0.498	0.433	0.274	0.792
BMSY (million ton)	1.336	1.144	0.751	2.189
BMSY/K	0.469	0.463	0.398	0.552
B_2020/K	0.168	0.161	0.094	0.248
B_2021/K	0.205	0.195	0.108	0.314
AveB_2019_2021/K	0.185	0.179	0.106	0.269
B_2020/BMSY	0.358	0.339	0.212	0.526
B_2021/BMSY	0.440	0.412	0.238	0.673
AveB_2019_2021/BMSY	0.396	0.378	0.238	0.574

Base case 1

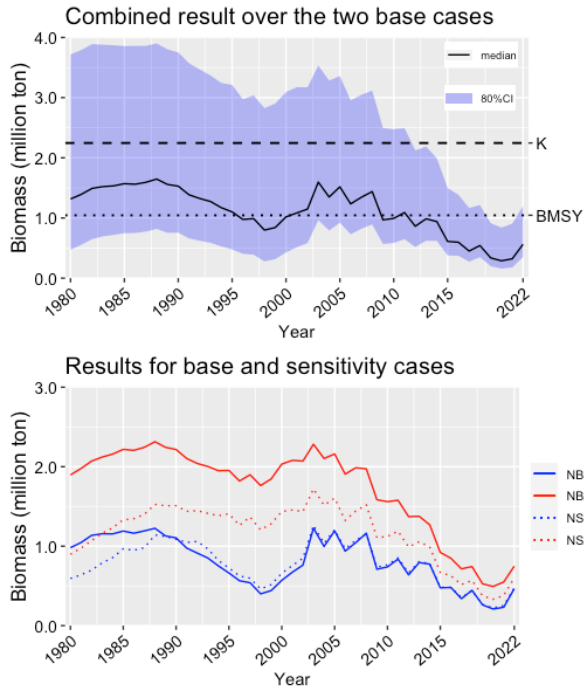
	Mean	Median	Lower10th	Upper10th
C_2021	0.092	0.092	0.092	0.092
AveC_2019_2021	0.141	0.141	0.141	0.141
AveF_2019_2021	0.606	0.609	0.374	0.831
F_2021	0.405	0.399	0.243	0.574
FMSY	0.519	0.524	0.324	0.704
MSY (million ton)	0.429	0.419	0.358	0.508
F_2021/FMSY	0.806	0.768	0.542	1.113
AveF_2019_2021/FMSY	1.205	1.167	0.844	1.596
K (million ton)	1.978	1.712	1.246	2.975
B_2021 (million ton)	0.257	0.231	0.161	0.379
B_2022 (million ton)	0.514	0.465	0.332	0.748
AveB_2020_2022	0.335	0.302	0.224	0.481
BMSY (million ton)	0.908	0.800	0.605	1.309
BMSY/K	0.468	0.460	0.408	0.544
B_2021/K	0.138	0.136	0.085	0.193
B_2022/K	0.279	0.272	0.171	0.396
AveB_2020_2022/K	0.181	0.180	0.117	0.246
B_2021/BMSY	0.295	0.288	0.191	0.406
B_2022/BMSY	0.597	0.575	0.382	0.839
AveB_2020_2022/BMSY	0.387	0.377	0.263	0.518

Base case 2

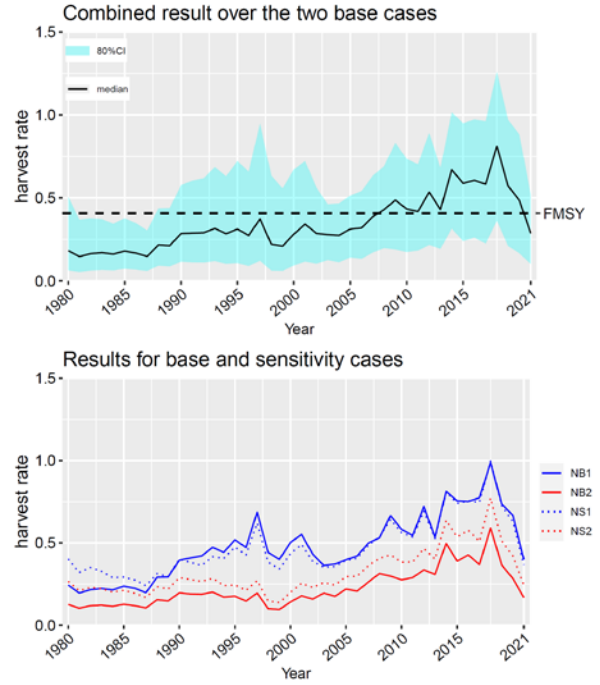
	Mean	Median	Lower10th	Upper10th
C_2021	0.092	0.092	0.092	0.092
AveC_2019_2021	0.141	0.141	0.141	0.141
AveF_2019_2021	0.322	0.275	0.126	0.589
F_2021	0.196	0.168	0.080	0.352
FMSY	0.288	0.255	0.106	0.525
MSY (million ton)	0.402	0.390	0.302	0.504
F_2021/FMSY	0.759	0.700	0.399	1.165
AveF_2019_2021/FMSY	1.218	1.173	0.664	1.785
K (million ton)	3.980	3.448	1.718	7.268
B_2021 (million ton)	0.646	0.549	0.262	1.148
B_2022 (million ton)	0.879	0.748	0.409	1.510
AveB_2020_2022	0.706	0.602	0.307	1.234
BMSY (million ton)	1.812	1.588	0.839	3.177
BMSY/K	0.466	0.459	0.391	0.553
B_2021/K	0.170	0.160	0.097	0.253
B_2022/K	0.244	0.223	0.125	0.393
AveB_2020_2022/K	0.189	0.178	0.107	0.284
B_2021/BMSY	0.366	0.340	0.219	0.539
B_2022/BMSY	0.526	0.478	0.277	0.837
AveB_2020_2022/BMSY	0.407	0.377	0.242	0.606

4.2.3 Time series plots for base case models and aggregated results

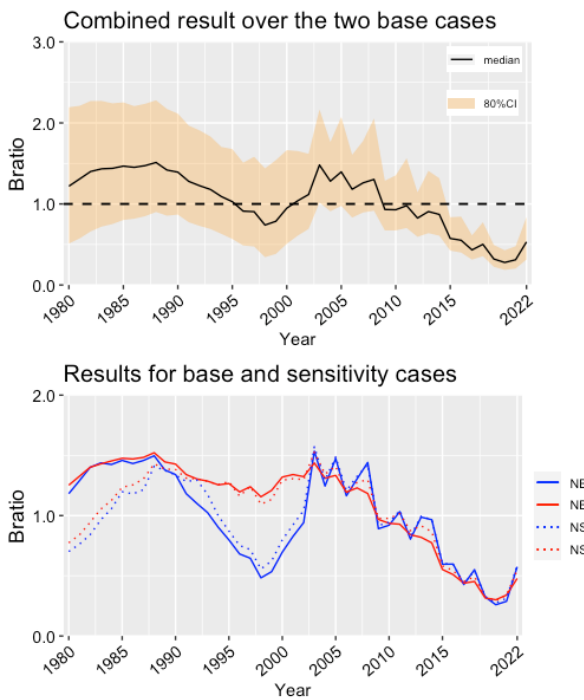
(a) Biomass



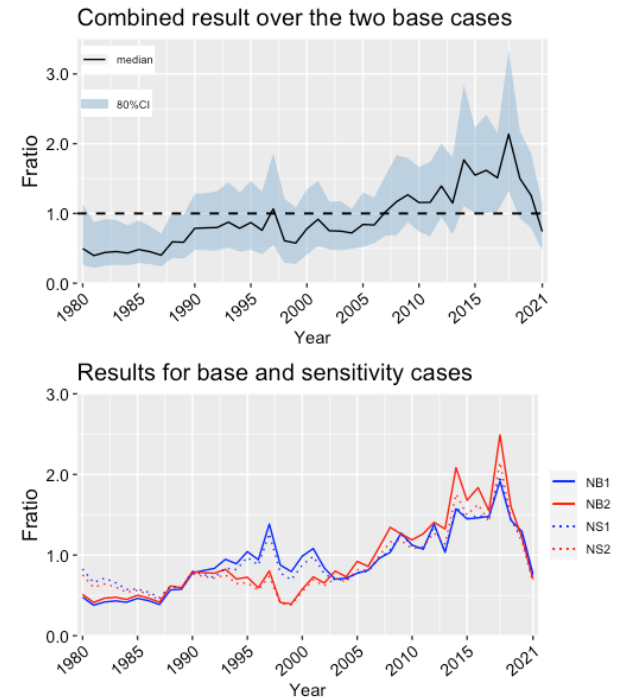
(b) Harvest rate



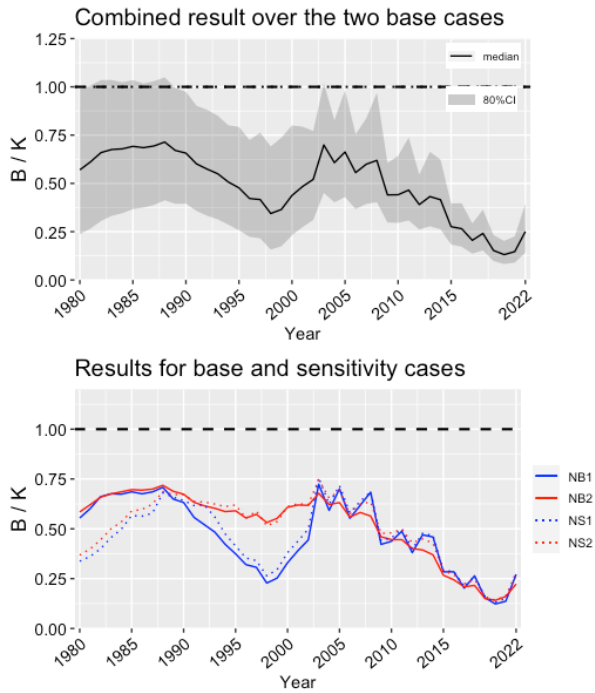
(c) B-ratio



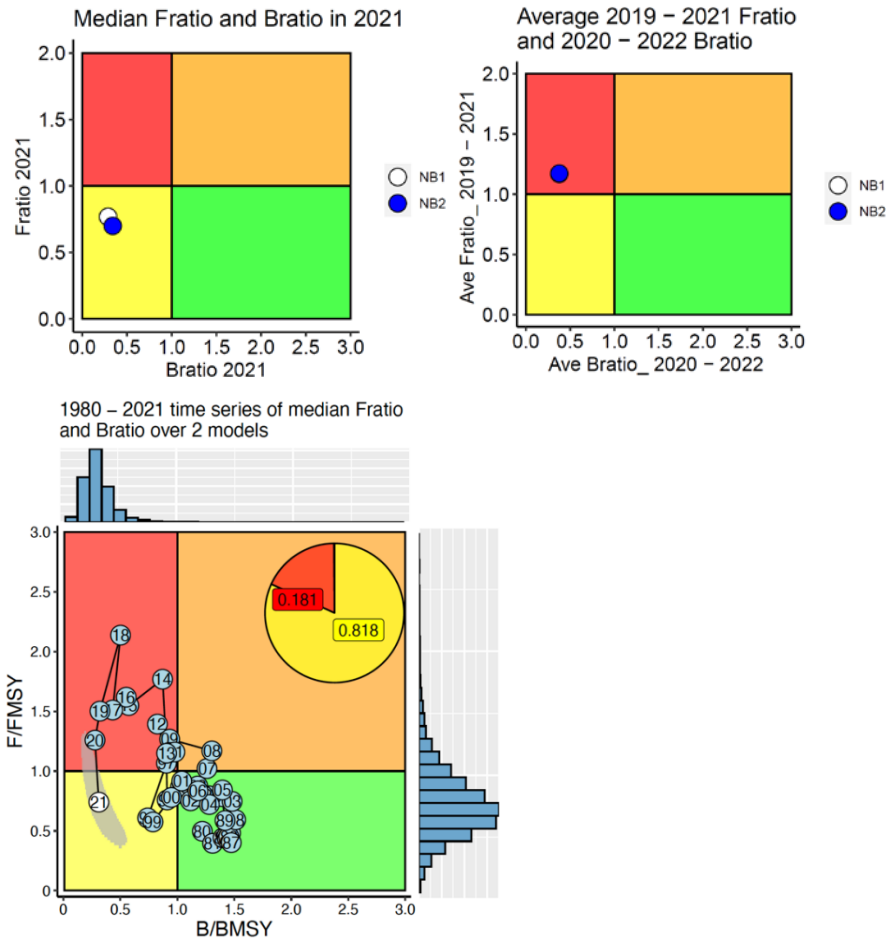
(d) F-ratio



(e) Depletion level relative to K

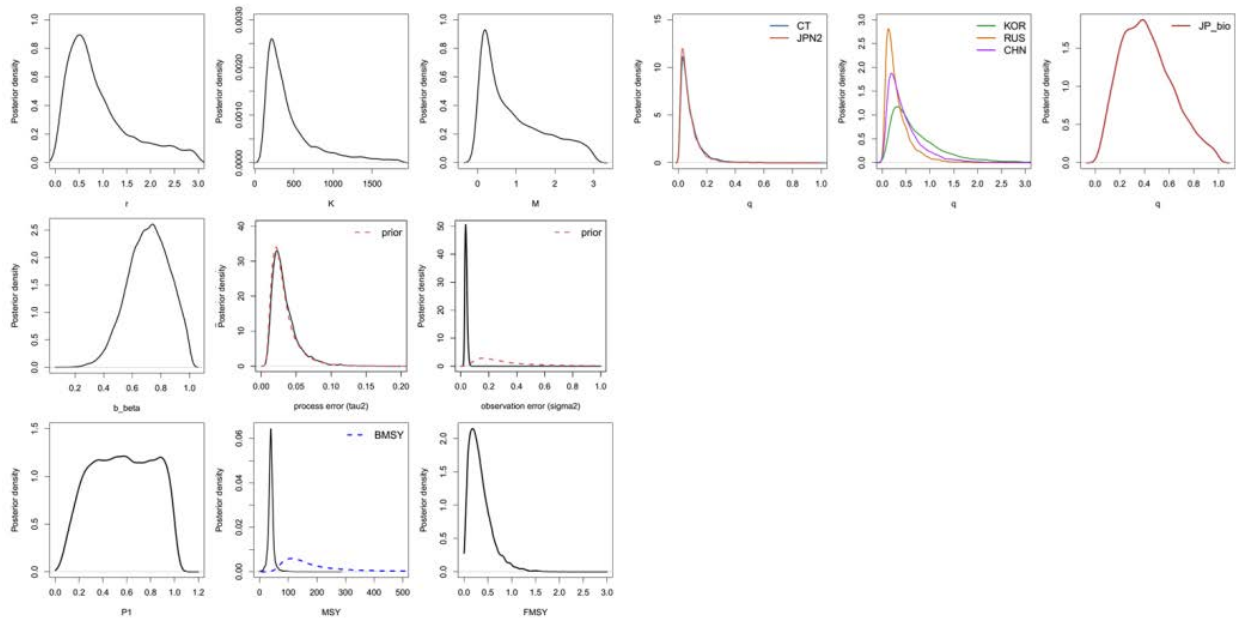


4.2.4 Kobe plots



4.3 CHINESE TAIPEI

4.3.1 Prior and posterior distributions for Base case model 1 (as an illustrative example)



4.3.2 Summary of estimates of parameters and reference points

(a) Base case1

	Mean	Median	Lower 10th	Upper 10th
Catch ₂₀₂₁	9.22	9.22	9.22	9.22
F ₂₀₁₉₋₂₀₂₁	0.32	0.29	0.11	0.57
F ₂₀₂₁	0.20	0.18	0.07	0.35
F _{M_{SY}}	0.27	0.25	0.09	0.48
MSY	39.83	39.03	29.72	48.79
F ₂₀₂₁ /F _{M_{SY}}	0.87	0.74	0.47	1.25
F ₂₀₁₉₋₂₀₂₁ /F _{M_{SY}}	1.37	1.20	0.78	1.90
K	461.13	334.05	168.60	979.08
B ₂₀₂₁	69.86	51.39	26.69	126.30
B ₂₀₂₂	95.83	72.59	40.91	165.99
B ₂₀₂₀₋₂₀₂₂	76.86	57.03	30.93	137.56
B _{M_{SY}}	212.03	155.50	86.45	425.58
B _{M_{SY}} /K	0.48	0.47	0.39	0.59
B ₂₀₂₁ /K	0.17	0.16	0.09	0.25
B ₂₀₂₂ /K	0.24	0.23	0.12	0.37
B ₂₀₂₀₋₂₀₂₂ /K	0.18	0.18	0.10	0.28
B ₂₀₂₁ /B _{M_{SY}}	0.35	0.32	0.20	0.51
B ₂₀₂₂ /B _{M_{SY}}	0.50	0.46	0.26	0.75
B ₂₀₂₀₋₂₀₂₂ /B _{M_{SY}}	0.39	0.36	0.22	0.56

(b) Base case2

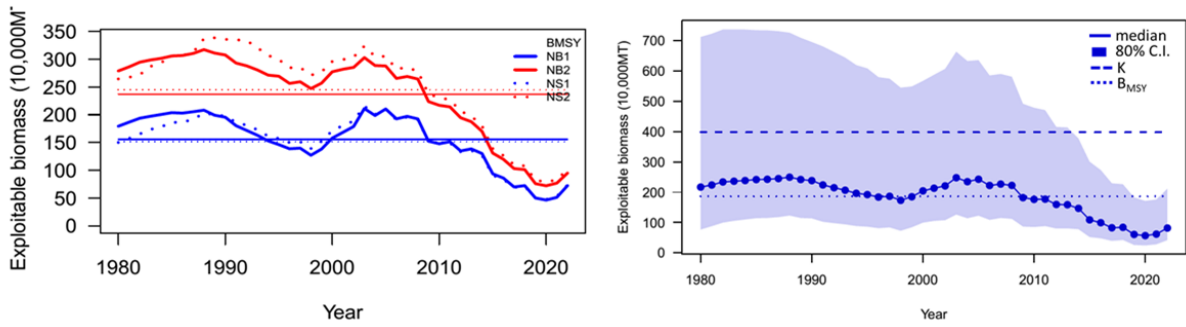
	Mean	Median	Lower 10th	Upper 10th
Catch ₂₀₂₁	9.22	9.22	9.22	9.22
F ₂₀₁₉₋₂₀₂₁	0.24	0.19	0.06	0.51
F ₂₀₂₁	0.15	0.12	0.04	0.30
F _{M_{SY}}	0.21	0.16	0.05	0.44
MSY	38.69	38.56	23.23	50.81
F ₂₀₂₁ /F _{M_{SY}}	1.57	0.76	0.39	1.68
F ₂₀₁₉₋₂₀₂₁ /F _{M_{SY}}	2.35	1.22	0.66	2.47
K	668.95	513.95	192.71	1447.90
B ₂₀₂₁	111.16	77.03	30.72	219.30
B ₂₀₂₂	133.06	95.12	43.84	252.99
B ₂₀₂₀₋₂₀₂₂	116.93	81.91	34.34	228.55
B _{M_{SY}}	310.02	237.25	97.47	645.28
B _{M_{SY}} /K	0.48	0.47	0.38	0.60
B ₂₀₂₁ /K	0.18	0.16	0.08	0.29
B ₂₀₂₂ /K	0.23	0.21	0.09	0.38
B ₂₀₂₀₋₂₀₂₂ /K	0.19	0.17	0.08	0.31
B ₂₀₂₁ /B _{M_{SY}}	0.37	0.33	0.18	0.61
B ₂₀₂₂ /B _{M_{SY}}	0.48	0.43	0.21	0.80
B ₂₀₂₀₋₂₀₂₂ /B _{M_{SY}}	0.40	0.36	0.19	0.65

(c) Joint estimates of the base cases 1 and 2

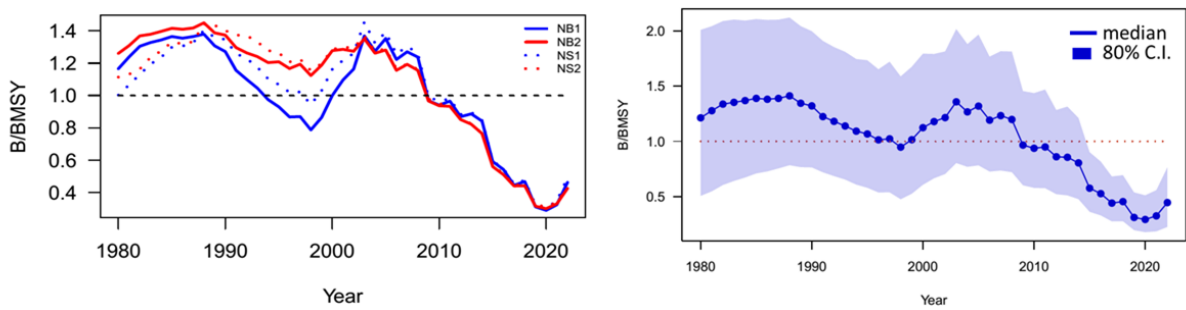
	Mean	Median	Lower 10th	Upper 10th
Catch ₂₀₂₁	9.22	9.22	9.22	9.22
F ₂₀₁₉₋₂₀₂₁	0.28	0.24	0.08	0.55
F ₂₀₂₁	0.17	0.15	0.05	0.33
F _{M_{SY}}	0.24	0.21	0.06	0.46
MSY	39.26	38.85	26.61	49.79
F ₂₀₂₁ /F _{M_{SY}}	1.22	0.75	0.43	1.45
F ₂₀₁₉₋₂₀₂₁ /F _{M_{SY}}	1.86	1.21	0.71	2.16
K	565.04	398.25	177.80	1274.00
B ₂₀₂₁	90.51	61.96	28.19	176.10
B ₂₀₂₂	114.45	82.04	42.16	212.07
B ₂₀₂₀₋₂₀₂₂	96.89	66.88	32.23	185.61
B _{M_{SY}}	261.02	186.40	90.58	563.27
B _{M_{SY}} /K	0.62	0.47	0.20	1.12
B ₂₀₂₁ /K	0.17	0.16	0.08	0.27
B ₂₀₂₂ /K	0.23	0.22	0.10	0.37
B ₂₀₂₀₋₂₀₂₂ /K	0.19	0.18	0.09	0.29
B ₂₀₂₁ /B _{M_{SY}}	0.36	0.33	0.19	0.56
B ₂₀₂₂ /B _{M_{SY}}	0.49	0.45	0.23	0.77
B ₂₀₂₀₋₂₀₂₂ /B _{M_{SY}}	0.39	0.36	0.20	0.60

4.3.3 Time series plots for base case models and aggregated results

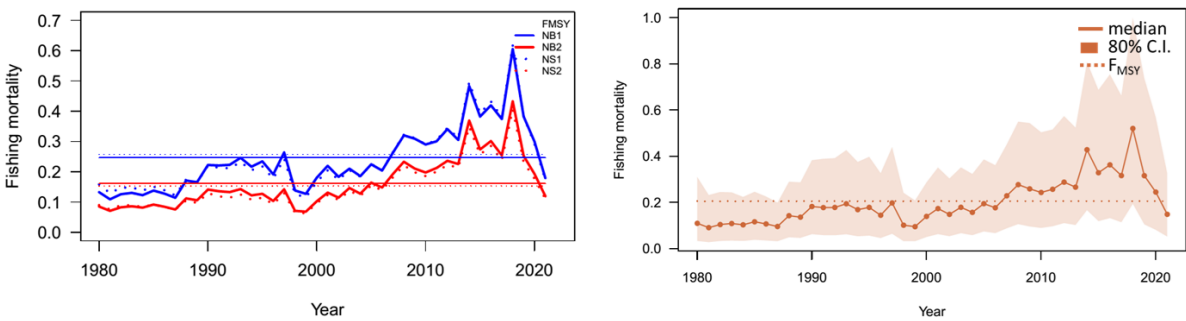
(a) Biomass



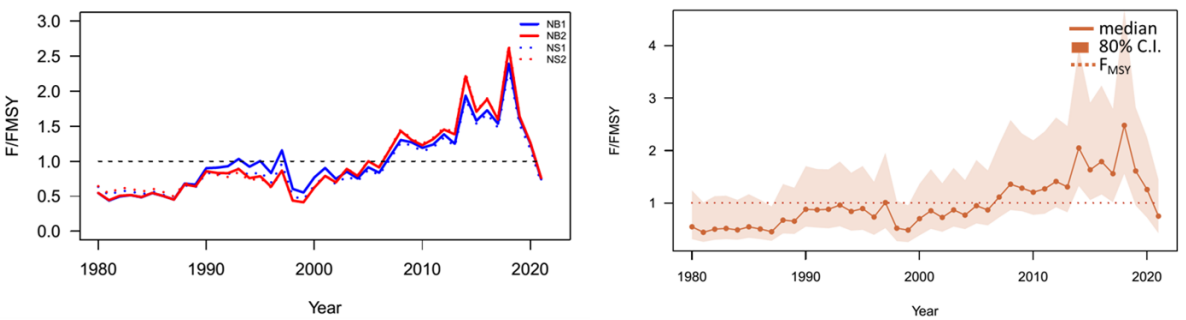
(b) B-ratio (B/B_{MSY})



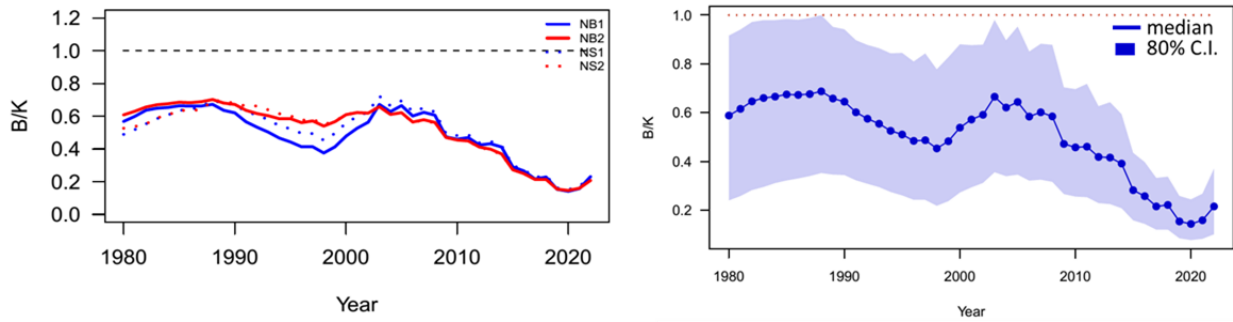
(c) Exploitation rate (F)



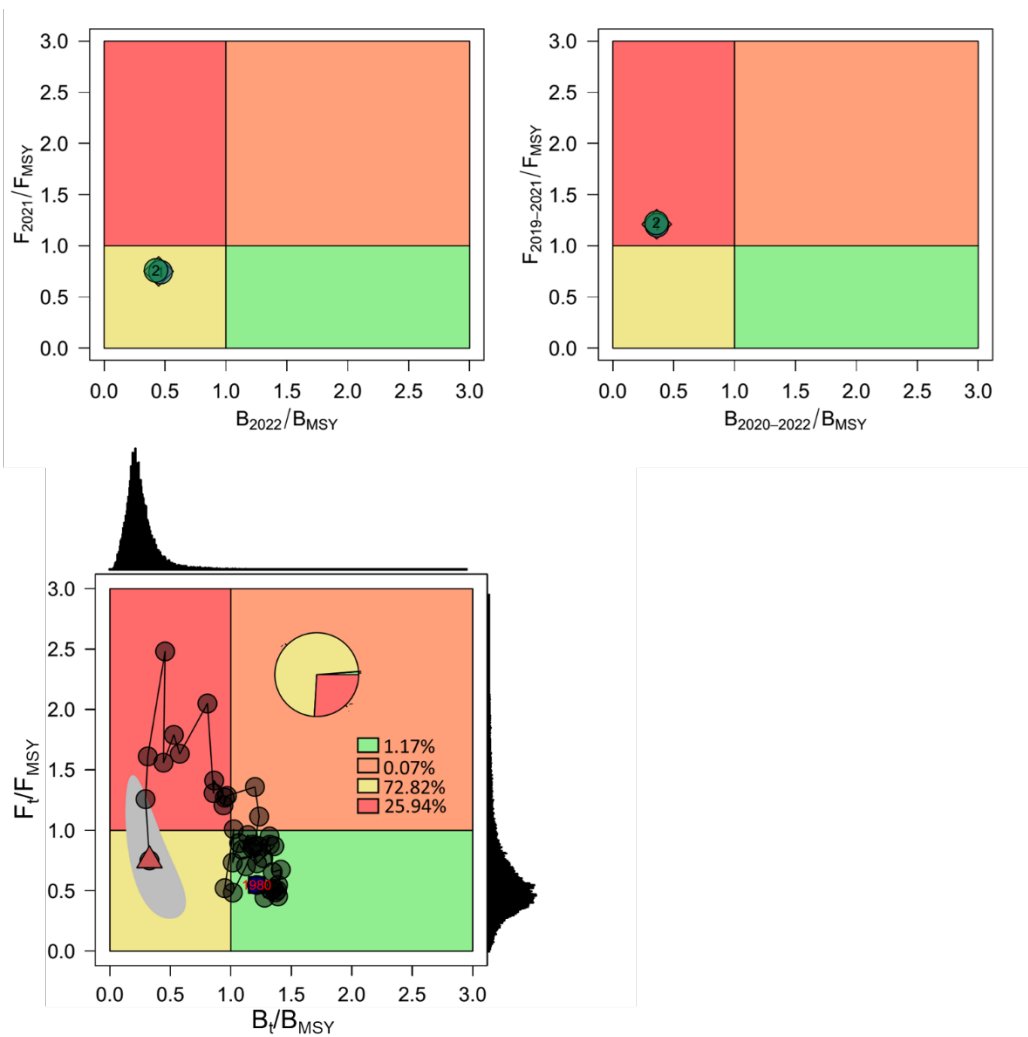
(d) F-ratio (F/F_{MSY})



(e) B/K



4.3.4 Kobe plots



5 SOME AGGREGATED RESULTS FOR VISUALIZATION PURPOSE

5.1 Visual presentation of results

The graphical presentations for times series of biomass (B), B-ratio (B/B_{MSY}), exploitation rate (F), F-ratio (F/F_{MSY}) and B/K are shown in Figure 3.



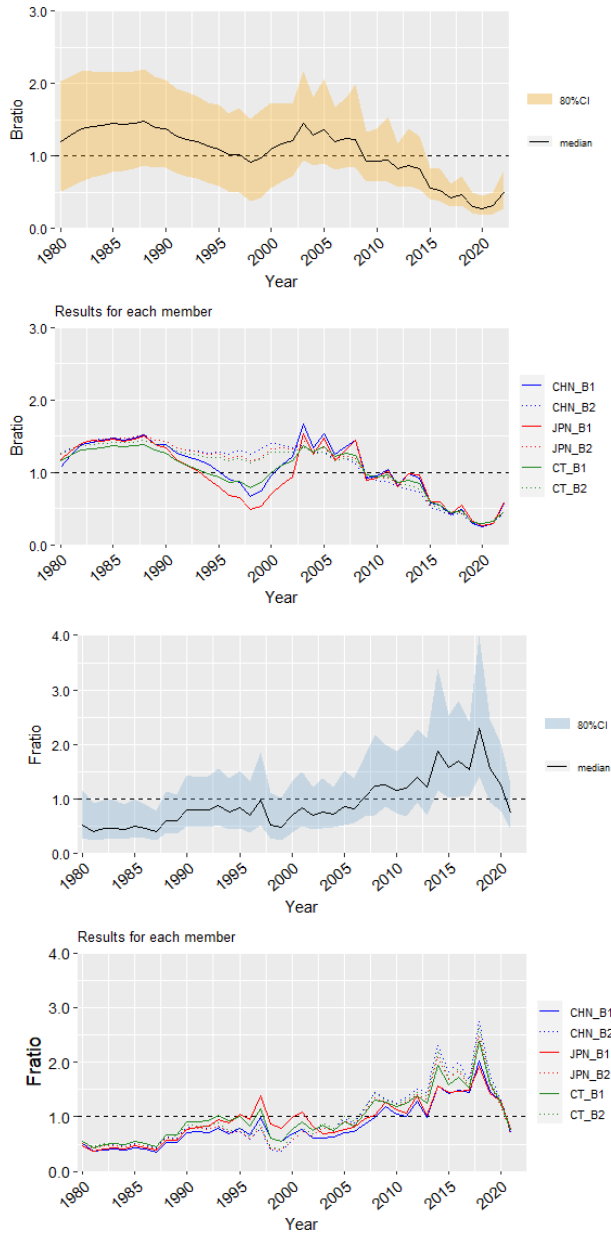


Figure 3. Time series of median estimated values of six runs for biomass, harvest rate, B-ratio, F-ratio and depletion level relative to K. The solid and shaded lines correspond to B1 and B2, respectively.

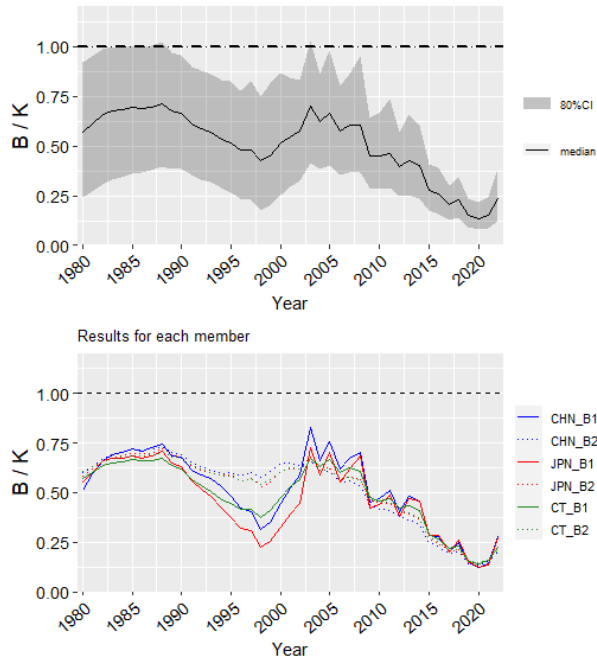


Figure 3 (Continued).

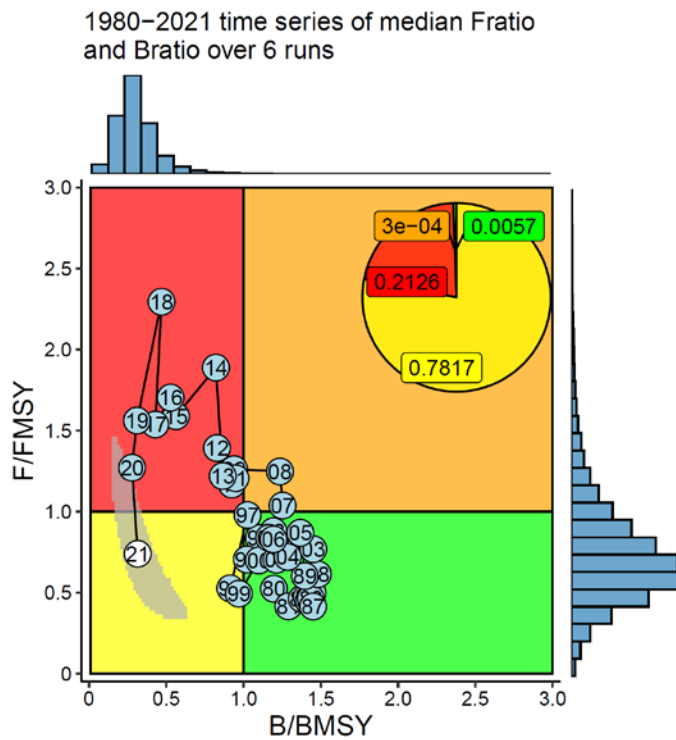


Figure 4. Kobe plot with time trajectory. The data are aggregated across 6 model results (2 base-case models by 3 Members).

5.2 Summary table

Table 3. Summary of estimates of reference quantities. Median and credible interval for the aggregated results are presented. In addition, median values of Member's combined results (over B1 and B2) are shown.

	Median	Lower10%	Upper10%	Median_CHN	Median_JPN	Median_CT
C_2021 (10000 t)	9.221	9.221	9.221	9.221	9.221	9.221
AveC_2019_2021 (10000 t)	14.141	14.141	14.141	14.141	14.141	14.141
AveF_2019_2021	0.350	0.111	0.733	0.402	0.456	0.238
F_2021	0.213	0.071	0.467	0.241	0.287	0.149
FMSY	0.313	0.084	0.619	0.363	0.407	0.206
MSY	40.281	29.911	51.100	41.316	40.649	38.850
F_2021/FMSY	0.739	0.452	1.259	0.729	0.740	0.751
AveF_2019_2021/FMSY	1.192	0.757	1.883	1.203	1.169	1.211
K (10000 t)	281.400	142.200	919.083	249.200	224.579	398.200
B_2021 (10000 t)	43.260	19.750	129.400	38.260	32.149	61.950
B_2022 (10000 t)	65.500	36.900	162.000	62.190	56.264	82.035
AveB_2020_2022 (10000 t)	49.147	25.386	138.103	44.845	39.111	66.877
BMSY (10000 t)	131.800	70.360	409.910	118.800	104.432	186.400
BMSY/K	0.469	0.386	0.621	0.465	0.460	0.503
B_2021/K	0.151	0.088	0.240	0.149	0.147	0.159
B_2022/K	0.237	0.122	0.385	0.243	0.251	0.216
AveB_2020_2022/K	0.177	0.103	0.270	0.176	0.179	0.175
B_2021/BMSY	0.315	0.198	0.499	0.310	0.311	0.327
B_2022/BMSY	0.494	0.272	0.810	0.499	0.532	0.447
AveB_2020_2022/BMSY	0.368	0.232	0.564	0.364	0.377	0.360

6 CONCLUDING REMARKS

See the Executive Summary.

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Updated total catch, CPUE standardizations and biomass estimates for the stock assessment of Pacific saury

Year	Total catch (metric tons)	Biomass JPN (VAST, 1000 metric tons)	CV (%)	CPUE CHN (metric tons/vessel/day)	CPUE JPN_ea rly (metric tons/net haul)	CPUE JPN_lat e (metric tons/net haul)	CPUE KOR (metric tons/vessel/day)	CPUE RUS (metric tons/vessel/day)	CPUE CT (metric tons/net haul)	Joint CPU E (VAST)	CV (%)
1980	238510				0.72						
1981	204263				0.63						
1982	244700				0.46						
1983	257861				0.87						
1984	247044				0.81						
1985	281860				1.4						
1986	260455				1.13						
1987	235510				0.97						
1988	356989				2.36						
1989	330592				3.06						
1990	435869				1.95						
1991	399017				3.13						
1992	383999				4.32						
1993	402185				3.25						
1994	332509					3.91		16.97		1.29	0.35
1995	343743					2.12		20.10		1.60	0.36
1996	266424					1.76		16.10		0.67	0.35
1997	370017					3.65		11.69		1.34	0.36
1998	176364					0.98		12.47		0.79	0.37
1999	176498					0.82		12.57		0.50	0.39
2000	286186					1.24		17.30		0.91	0.37
2001	370823					1.63	7.75	21.09	1.57	0.90	0.29
2002	328362					1.08	9.59	20.02	1.63	0.68	0.28
2003	444642	1263.3	22.5			2.05	14.03	35.92	2.67	1.18	0.28
2004	369400	725.7	20.4			2.61	9.61	47.06	1.45	1.08	0.28
2005	473907	962.7	30.9			4.32	17.32	49.53	2.38	1.63	0.27
2006	394093	644.9	27.4			4.52	7.89	34.60	1.27	0.59	0.27
2007	520207	700.5	29.9			4.17	7.50	43.16	2.37	1.05	0.27

Annex I: SC07 Report

2008	617509	1007.1	26.1		5.15	16.04	42.40	2.90	1.95	0.28
2009	472177	427.8	21.9		4.22	7.80	21.29	1.57	1.03	0.28
2010	429808	570.8	27.1		1.78	8.13	23.66	1.93	1.07	0.27
2011	456263	938.2	36.3		2.47	9.08	28.46	2.50	1.26	0.29
2012	460544	330.4	20.2		2.72	8.08	24.47	2.47	1.14	0.27
2013	423790	756.4	25.3	11.39	1.83	11.52	22.13	2.80	1.02	0.27
2014	629576	528.6	21.8	12.47	3.28	17.64	25.35	3.72	1.32	0.27
2015	358883	299.5	19.2	14.49	1.68	6.97	16.48	2.33	0.99	0.28
2016	361688	425.2	25.2	6.81	1.74	9.38	17.76	2.44	0.72	0.27
2017	262639	164.7	25.5	6.66	1.13	4.71	8.59	1.79	0.79	0.27
2018	439079	336.8	26.7	12.78	1.89	10.08	25.92	3.12	1.38	0.28
2019	192377	231.4	21.4	6.71	0.70	2.27	8.47	1.41	0.54	0.27
2020	139646	44.5	112.0	4.81	0.49	2.61	7.20	1.23	0.33	0.29
2021	92206	200.9	31.6	5.04	0.33	2.31	2.82	0.81	0.22	0.28
2022		380.6	19.8							

Revised Regulations for Management of Scientific Data and Information

These Regulations are intended to apply while the NPFC develops comprehensive rules and procedures governing the security of, exchange of, access to and dissemination of data and computer code (referred to as code hereafter) held by, or accessed by Members of the Commission, its subsidiary bodies, the Secretariat, and by service providers, contractors, or consultants acting on their behalf or others so authorized for access by the Secretariat.

I. Guidance for Management of Scientific Data and Code

1. Objectives

The objectives of this Guidance are (1) to support stock assessments, ecosystem assessments and accumulation of scientific knowledge of fisheries resources under the Commission's jurisdiction, (2) to encourage cooperation on scientific analyses among Members, and (3) to establish a guidance on handling scientific data and code.

2. Scientific Data included in Members' Annual Reports

Scientific data (e.g., catch amount, number of vessels, number of fishing days and so on) included in Members' Annual Reports should be uploaded to the public section of the NPFC website for public access and use.

3. Other scientific data and code, not included in Members' Annual Reports, submitted for use in stock assessments and ecosystem assessments

The Secretariat should not disclose Members' scientific data or code submitted by means other than Members' Annual Reports or meeting documents open for the public in accordance with paragraph 4.

Members may cite and/or use such data or code when working on matters under consideration by the Scientific Committee and its subsidiary bodies, including informal working groups.

If a Member or cooperating non-Member wishes to cite and/or use these data or code for work that is intended to be conducted or shared outside of the NPFC, such Member or non-Member should consult with the provider(s) of the data or code through the Secretariat, stating 1) the data or code subject to the request, and 2) the purpose for which the data or code is intended to be used. The Secretariat should immediately notify the provider(s) of the request. The provider(s) should inform the Secretariat within 30 calendar days whether to accept or reject the request. If the provider(s) reject the request, the provider(s) should state the reason(s) for the rejection. If the provider(s) accept the request, the provider(s) may request an agreed-upon credit line in any subsequently-created product. Those who cited/used data or code should not distribute the data or code further nor use it for the purpose not declared.

II. Regulations for management of scientific meeting documents, meeting reports and intersessional communications on the NPFC website

4. Working Papers, Meeting Info Papers, Information Papers, Reference Documents/Papers, Observer Papers

To enhance and encourage collaborations with researchers, scientists, RFMOs, and science organizations, and to encourage transparency of the NPFC processes, the SC recommends making the above named documents available to the public through the NPFC website. The default rule would be that all the above named documents would be released to the public 45 days (inclusive of weekends and holidays) following the closure of the meeting to which they were submitted. All meeting papers submitted to any NPFC scientific meetings through the Secretariat should indicate how they should be cited in accordance with the NPFC Document Rules. If the document author(s) or submitting Member do not authorize the release of the document, they must indicate that clearly on the cover page or first page of the document, OR they may request to the Secretariat in writing of their desire to not release the document during the 44 days prior to document publication on the website.

5. SC Meeting Reports, SC Subsidiary Body Reports (SSC, TWG) and Other Scientific Reports (Workshop)

5.1. The SC recommends that the above named documents be released to the public after acceptance by the Commission Members within 45 days in accordance with the procedures stated in Paragraph 8.2 of Rules of Procedure.

5.2. For SC subsidiary body reports: If there are portions of the report which are deemed by the subsidiary body to be too sensitive to release prior to the SC report, the specific sensitive portions may be redacted, and the report released as described in #5.1 above. Following the SC meeting, the entire report (inclusive of redacted portions) will be released in conjunction with the SC report. If the report as a whole is deemed too sensitive to release, the report may be held and released to the public in conjunction with the SC Meeting Report. Decisions about which portion or whether the whole report is to be redacted shall be made during the subsidiary body meeting.

6. Intersessional Communication using the NPFC Collaboration website

The NPFC has made available a web-based tool to facilitate discussion of its subsidiary bodies, informal working groups, discussion groups, and other temporary groups on a project-by-project basis. Access to this tool is restricted to members of a specific project/topic. Following the completion of the discussion, the group facilitator/chair may summarize the discussions to make them available and accessible to the appropriate Commission body (TCC, SC, SWG MSE PS, Commission). At the conclusion of the discussions of the group and after summary is complete, the discussion text and documents will be archived by the Secretariat but not maintained on the website except for a summary made by the group facilitator/chair.

7. Redaction or withdrawal of Working Papers, Meeting Info Papers, Information Papers, Reference Documents/Papers, Observer Papers which were submitted to workshop or meeting

Documents of the types listed above may not be redacted or withdrawn from the public or Member-only area of the website by a Member or the Secretariat once it has been published unless notification is provided to all Members which details the reason for the withdrawal request. If an error is identified in a publicly available document, the member responsible for the document submission can submit a cover letter or document text which describes the error and the resolution to be prepended to the original document. Errors identified in documents prior to publication on the public website or during meetings or workshops can be revised or documents withdrawn before or during the meeting, but other members or meeting participants must be notified of the specifics of the changes as soon as possible.

Scientific projects

#	Project	Time	Status	Next step: activities, required funds
1.1	GIS database/module as a part of NPFC database management system for spatial management of bottom fisheries and VMEs	2018-	<i>In progress</i> A map of bottom fishing footprint has been deployed on the NPFC website.	Further development of the map. <i>2023 FY: 0,7mil JPY (5,000USD).</i> <i>Source: Database management.</i>
1.2	Joint spatial/temporal map of Members' catch and effort on Pacific saury with a spatial resolution of one-degree grids and a temporal resolution of one month.	2018-	<i>In progress.</i> Spatial/temporal map of Members' Pacific saury catch and effort has been updated up to 2021.	Update the map up to 2022. <i>2023 FY: 0,2mil JPY (1,500USD).</i> <i>Source: Database management.</i>
2	Pacific saury stock assessment meeting (meeting costs)	Every year	<i>TWG PSSA meetings: Feb 2017, Dec 2017, Nov 2018, Mar 2019.</i> <i>SSC PS meetings: Nov 2019, Nov 2020, Oct 2021.</i>	SSC PS11 meeting. Dates TBD. <i>2023 FY: 1.4mil JPY (10,000USD)</i> <i>Source: SC fund.</i>
3	Chub mackerel stock assessment meeting (meeting costs)	Every year	<i>TWG CMSA meetings: Dec 2017, Mar 2019, Nov 2020, Jun 2021.</i>	TWG CMSA07 and 08 meetings. Dates TBD. <i>2023 FY: 4.2mil JPY (15,000USD x 2 mtngs)</i> <i>Source: SC fund.</i>
4	Expert to review Pacific saury stock assessment (consultant fee and travel costs)	TBD	<i>Under consideration.</i> SSC PS: to determine time and format.	<i>2023 FY: No funds required.</i>

5	Observer Program	2018-	<p><i>In progress</i></p> <p>A study on the existing observer programs of Members and those of other RFMOs has been done.</p> <p>Scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means for Pacific saury have been reviewed (SSC PS04 report, Annex E).</p>	<p>Identify data gaps which can be fulfilled by an observer program.</p> <p><i>2023 FY: No funds required.</i></p>
6	Promotion of cooperation with NPAFC including macro-scale multinational survey in the North Pacific in 2022	2021-	<p><i>In progress.</i></p> <p>The SC provided suggestions to the work plan to implement the MOC between the NPFC and NPAFC.</p> <p>The NPAFC reported on the 2022 IYS Winter High Seas Research Expedition which was co-sponsored by NPFC.</p>	<p><i>2023 FY: No funds required.</i></p>
7	Invited expert to support TWG CMSA (consultant fee and travel costs)	2020-	<p>An external expert has been contracted to support the TWG CMSA in testing candidate stock assessment models.</p>	<p><i>2023 FY: 1,4mil JPY (10,000USD)</i></p> <p><i>Source: SC fund.</i></p>
8	Invited expert to support SSC PS (consultant fee and travel costs)	2019-	<p>An external expert has been contracted to support SSC PS during its meetings.</p>	<p><i>2023 FY: 2.1mil JPY (15,000USD)</i></p> <p><i>Source: SC fund.</i></p>

9	Standardization of bycatch species list and fish species identification guides (translation of the existing fish ID guide from Japanese to additional languages)	2019-2022	<i>In progress.</i> Bycatch species list has been compiled. The fish ID guide has been submitted to SSC BF-ME for review.	Printing costs. <i>2022 FY: 1.4mil JPY (10,000USD).</i> <i>Source: SC fund.</i>
10	PICES Annual meeting	Every year		<i>Travel support to a participant of the SC or its subsidiary bodies.</i> <i>2023 FY: 1mil JPY (7,000USD)</i> <i>Source: SC fund.</i>
11	SWG MSE PS (meeting costs)	2022-	<i>Proposed.</i>	SWG MSE PS04. Dates TBD. <i>2023 FY: 1.4mil JPY (10,000USD)</i> <i>Source: Special Project fund.</i>
12	PICES 2023 session on Seamount Ecology and VME Identification	2023	<i>Proposed.</i> This session will be co-convended by SC participants, and WG47 co-chairs and members.	<i>2023 FY: 0.7mil JPY (5,000USD)</i> <i>Source: SC Fund</i>
13	Understanding the basis by which other RFMOs' VME encounter thresholds were determined by taxa and gear-type	2023	<i>Proposed.</i>	<i>2023 FY: 0.7mil JPY (5,000USD)</i> <i>Source: SC Fund</i>
	Total			<i>2022 FY: SC Fund 1.4mil JPY.</i> <i>2023 FY: SC Fund 11,5mil.</i> <i>Database management 0.9mil.</i> <i>2023 FY: Special Project Fund 1.4mil JPY.</i>

* The recurrent projects should be funded annually from the SC Fund allocated by the Commission. If total costs exceed the SC Fund, the SC may propose to use the Special Project Fund subject to the decision by the Commission.

Past projects

#	Project	Time	Status	Next step: activities, required funds
1	NPFC/FAO VME workshop	2018-2019	<i>Concluded.</i>	
2	Workshop to address data requirements and data sharing for SAI assessment and other tasks identified in the Work Plan by SSC VME and SSC BF	2018	<i>Concluded.</i>	
3	Workshop on biological reference points (BRP), harvest control rule (HCR) and management strategy evaluation (MSE)	2019	<i>Concluded.</i>	
4	Literature review of target and limit reference points used in pelagic species fisheries by other general RFMOs and other fishery management bodies	2018	<i>Done. Available on the NPFC website.</i>	
5	Joint PICES-NPFC workshop (W11) on <i>The influence of environmental changes on the potential for species distributional shifts and subsequent consequences for estimating abundance of Pacific saury</i>	2019	<i>Concluded.</i>	

6	VME taxa identification guide	2017-2022	<i>Concluded.</i> VME taxa ID guide has been printed out and distributed to Members.	Test the VME taxa ID guide by observers and revise if needed.
7	International Course for NPFC observers for VME indicator taxa identification (consultant fees and travel costs for two lecturers, meeting costs)	2022	<i>Postponed until further notice.</i>	
8	PICES-ICES-FAO Small Pelagic Fish Symposium, 7-11 November 2022, Lisbon, Portugal.	2022	<i>Concluded.</i> NPFC contributed 15,000USD to the organizers for the symposium logistics.	

Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

Exchange of data and information in accordance with the information-sharing and data confidentiality policies of each Commission;

- Create a SharePoint inter-commission communication system to share news, reports, guideline documents, and other information relevant to the management of the mutual area of interest in an easily accessible form.

Timeline	Deliverables	Milestones
August 2021–June 2022	<p>NPAFC/NPFC Sharepoint Terms of Reference to describe structure, capabilities, access rights, and control issues</p> <p>NPAFC/NPFC Sharepoint service in a test mode</p> <p>NPAFC/NPFC Sharepoint service in full operational mode</p>	<p>Terms of Reference (ToR) agreed by both commissions – September 15, 2021</p> <p>Test mode – December 31, 2021</p> <p>Full operational mode – June 30, 2022</p>

- Establish a mechanism of general information exchange (e.g., MCS activity information, fleet activity information, map of catch and fishing efforts).

Timeline	Deliverables	Milestones
August 2021–December 2022	<p>NPAFC/NPFC communication and information exchange plan</p> <p>Regular mutual email conferences to exchange MCS and enforcement activities information</p>	<p>A plan agreed by the commissions – First half of 2022</p> <p>Summer–autumn of 2022</p>
2022–2025	<p>NPFC historical footprint (catch and fishing efforts) of the fisheries</p> <p>Annual data reporting/sharing of Pacific salmon as by-catch by NPFC fishing vessels</p>	<p>Pacific saury – available on the NPFC website</p> <p>Japanese sardine – ...</p> <p>Mackerel – ...</p> <p>Japanese flying squid – ...</p>

	<p>Interactive Mapping System (IMS) for the INPFC/NPAFC High-Seas Salmonid Tag-Recovery Database</p>	<p>IMS in a test mode with limited access – May 2022.</p> <p>IMS in full operational mode – May 2023</p>
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- Establish a practice of sharing information on suspicious fishing vessels identified in overlapping convention area including stateless vessels and unregistered vessels.

Timeline	Deliverables	Milestones
August 2021–June 2022	Vessel of Interest folder which has been treated as confidential at the NPAFC/NPFC Sharepoint	<p>Vessel of Interest folder description is included in the ToR agreed by the commissions – September 15, 2021</p> <p>Vessel of Interest information is included in the folder – June 30, 2022</p>

Collaboration on research efforts relating to stocks and species of mutual interest, including stock assessments;

- Implement Pan-Pacific research survey plans in winter 2022, organize a comprehensive study of its outcome at the special session of the IYS Synthesis Symposium.

Timeline	Deliverables	Milestones
August 2021–February 2022	<p>NPFC proposal to the Pan-Pacific High Seas Research Expedition cruise plans</p> <p>NPFC participation in the country leads meetings to coordinate/contribute to the Expedition plans</p>	<p>NPFC proposal submitted to the NPAFC – November 2021</p> <p>[Status: The proposal was presented at the NPFC country leads meeting on 13 October and then revised by the NPFC SC following the feedback from the meeting.]</p>

		<p>NPFC Science Manager / Scientific Committee Chairperson participates in the country leads meetings in August 2021–February 2022</p> <p><u>NPAFC presents a report on the expedition finding after its completion in 2022</u></p>
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- Harmonize Coordinate research activities identified in the NPFC/PICES and NPAFC/PICES Frameworks for Enhanced Scientific Cooperation in the North Pacific Ocean.

Timeline	Deliverables	Milestones
October 2021–May 2023	<p><u>Harmonization—Coordination of the research activities identified in the NPFC/PICES and NPAFC/PICES Frameworks agreed with PICES</u></p> <p><u>First draft and final version of the NPAFC/NPFC/PICES Framework for Enhanced Scientific Cooperation in the North Pacific Ocean</u></p>	<p><u>PICES Annual Meeting in October 2021/2022, a Study Group is created</u></p> <p><u>First draft Framework is produced by the Study Group—July 2022/2023</u></p> <p><u>Final version of Framework is adopted by NPAFC, NPFC, and PICES—May 2023/2024</u></p>

Implementation of conservation and management measures for stocks and species of mutual interest;

- Establish a mechanism to share the IUU vessel list of each Commission and its related information.

Timeline	Deliverables	Milestones
August 2021–May 2022	Accessible links to the NPAFC and NPFC IUU vessel list on both Commissions’ website	NPAFC is developing the IUU vessel listing process with a study group, and the

		NPAFC IUU vessel list is expected to be established for the first time – May 2022
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- Expand cooperation to collect and share information relating to species of special interest for each Commission.

Timeline	Deliverables	Milestones
August 2021–December 2025	<p>Information exchange on research cruise plans that can collect information on Pacific salmon and NPFC priority species</p> <p>Mutual scientific documents and publications on Pacific salmon and NPFC priority species distribution, relationships, and potential impact</p>	<p>Lists of scientific cruise plans are exchanged – May 2022</p> <p>NPAFC/NPFC/PICES Topic Session (or Workshop) on this issue is proposed for October 2022–2023 at the PICES Annual Meeting</p> <p>Mutual scientific documents and publications on Pacific salmon and NPFC priority species are published in 2023–2025</p>

- Develop, publish, and distribute public information about conservation on the high seas and consequences of IUU activity.

Timeline	Deliverables	Milestones
2021–2025	News releases and journal articles on the Commissions activities related to high seas resources conservation, MCS, and law enforcement	Secretariats annually exchange information on the relevant publications

For each agreed item a timeline, milestones, and deliverables will be mutually developed. Work plan will be discussed by the commissions and mutually agreed before June 2022.

Note: SC-related items are highlighted with grey.

Five-Year Research Plan and Work Plan of the Scientific Committee

North Pacific Fisheries Commission Scientific Committee 2022-2026 Research Plan

1.0 BACKGROUND

Article 10, Section 4(a) of the *Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean* states that the Scientific Committee (SC) will “recommend to the Commission a research plan including specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs.”

An initial draft of this research and accompanying work plan was presented for review during the 4th Preparatory Conference and a subsequent discussion was held by a small working group to establish science priorities for the NPFC. This plan draws on those discussions and was updated by the SC Chair based on the progress made by the NPFC since that Conference.

The development of multi-year science research or work plans is common across regional fisheries management organizations as well as domestic fisheries science agencies. This draft plan draws on such examples, and has been developed for consideration by the SC before it may be adopted by the Commission.

2.0 OBJECTIVES

The research plan is intended to guide the work of the Scientific Committee by identifying key research priorities and associated areas of work to be undertaken or maintained. The plan should also serve to: ensure efficient utilization of scarce resources within the Commission; inform Parties’ domestic research planning as a means of complementing the Commission’s science activities; and help the Commission identify potential sources of external funding.

It is not intended as an exhaustive plan describing all research activities that may be carried out by Parties, nor is it intended to preclude work already taking place. The plan should support the Commission’s primary objective (*Article 2* in the Convention), which is to “ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur”. The plan should also help the Scientific Committee fulfill its functions as specified in the Convention.

3.0 PRIORITY RESEARCH AREAS

In addition to discussions held during the Preparatory Conference (referenced above) followed by the Commission and Scientific Committee after their establishment, the identification of priority research areas draws largely from the Commission's Convention, which outlines specific functions for the Scientific Committee in *Article 10, Section 4*. These priority research areas are subject to the approval of the Commission, and may be revisited and/or revised as deemed appropriate by the Commission. Proposed rolling five-year work plans for each priority area are available in the attached (Annex 1).

The proposed priority research areas are:

1. Stock assessments for target fisheries and bycatch species
2. Ecosystem approach to fisheries management
3. Data collection, management and security

3.1 Stock Assessments

Rationale

Accurate stock assessments are critical in helping to ensure the long-term conservation and sustainable use of fisheries resources in the Convention Area. One of the primary functions of the Commission is setting total allowable catch or total allowable level of fishing effort, and as per *Article 7-1(b)*, this is to be in "accordance with the advice and recommendations of the Scientific Committee".

Consistent with this, *Article 10-4(b)* states that one of the functions of the Scientific Committee is to "regularly plan, conduct and review the scientific assessments of the status of fisheries resources in the Convention Area, identify actions required for their conservation and management, and provide advice and recommendations to the Commission".

Finally, *Article 10-4(i)* states that the Scientific Committee shall also "develop rules and standards, for adoption by the Commission, for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area".

The Scientific Committee should endeavor to understand the current status and trends in production of populations of priority species as agreed by the 2nd Commission meeting in 2016, as well as

factors that may affect future trends.

Areas of work

- Development of baseline assessment of the status of priority stocks
- Review of existing data standards in relation to stock assessments (e.g. Annual Report template, future vessel monitoring system)
- Stock delineation of important commercial species for the purpose of providing advice for the determination of management units
- For each commercial species, determination of data requirement, including data availability and data gaps; identification, where possible, of strategies to fill the data gaps, including for bycatch
- Development of a standardized method to provide advice to the Commission
- Development of assessment models by species and research as required to determine various assessment parameters

3.1.1. Pelagic fish stock assessment

Rationale

Pelagic fish and squids are primary fisheries resources for NPFC Members. They comprised more than 99% of total catch of species covered by the Convention. Many of them are migratory species with wide geographical distributions which include both EEZs of the North Pacific Rim countries and High Seas. Management of such stocks requires close cooperation among Members concerned to ensure sustainable use and conservation of fisheries resources.

Four fish species and two squid species were recognized by the Scientific Committee as priority species: Pacific saury *Cololabis saira*, Chub mackerel *Scomber japonicus*, Blue mackerel *Scomber australasicus*, Japanese sardine *Sardinops melanostictus*, Neon flying squid *Ommastrephes bartramii*, Japanese flying squid *Todarodes pacificus*.

Areas of work

- Completion of stock assessment for Pacific saury and development of the framework and timeline for its regular improvement and update
- Conducting stock assessment for Chub mackerel and other priority species considering their top-down prioritization (Spotted mackerel - Japanese sardine - Neon flying squid – Japanese flying squid) and available funds and capacity
- Identification of data gaps, determination of activities to address those gaps and development of

standards and mechanisms for data collection and verification

- Develop a management strategy evaluation (MSE) for Pacific saury in collaboration with NPFC's Commission, Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS), Technical and Compliance Committee (TCC), fishery managers, fishers, stakeholders, and observers.

3.1.2. Bottom fish stock assessment

Rationale

Data used for traditional stock assessment are sparse for bottom fish, and it is unlikely that traditional methods will be applicable for most deepwater species in the Convention Area. In addition, some bottom species have unique life cycles, sporadic recruitment patterns and irregular spawning-recruitment relationships that also makes difficult accurate stock assessment. All these require specific approaches for management and sustainable use of bottom fisheries resources. More than ten bottom species have been exploited by fisheries in the Convention Area during the last two decades. Two fish are recognized as priority species: North Pacific armorhead (NPA) *Pentaceros wheeleri* and splendid alfonsino (SA) *Beryx splendens*.

Areas of work

- Review of approaches applicable for stock assessment of target bottom species and investigate various management strategies
- Further development of the Adaptive Management approach for NPA and mechanism for its implementation
- Identification of data needs and establishment of activities to fill data gaps

3.2 Ecosystem Approach to Fisheries Management

Rationale

Article 3 (c) in the Convention states that: "In giving effect to the objective of this Convention, the following actions shall be taken individually or collectively as appropriate: (c) adopting and implementing measures in accordance with the precautionary approach and an ecosystem approach to fisheries, and in accordance with the relevant rules of international law, in particular as reflected in the 1982 Convention, the 1995 Agreement and other relevant international instruments".

Article 7-1 (c,d) in the Convention states that the Commission shall: “adopt, where necessary, conservation and management measures for species belonging to the same ecosystem or dependent upon or associated with the target stocks”; and, “adopt, where necessary, management strategies for any fisheries resources and for species belonging to the same ecosystem or dependent upon or associated with the target stocks, as may be necessary to achieve the objective of this Convention.”

Article 10-4 (d) states that the Scientific Committee shall “assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks.”

Areas of work

- Formulation of a work plan on how to implement the ecosystem approach to fisheries management in the Convention Area
- Vulnerable Marine Ecosystems
- Understand ecological interactions among species
- Ecosystem modelling
- Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species
- Other issues related to marine ecosystems including marine debris and pollution

3.2.1 Vulnerable Marine Ecosystems

Rationale

The identification of vulnerable marine ecosystems is a necessary precursor to implementing measures to protect these ecosystems, and such measures are explicitly called for in the Convention (e.g. *Article 7-1(e)*).

Article 10-4 (e) states that the Scientific Committee shall “develop a process to identify vulnerable marine ecosystems, including relevant criteria for doing so, and identify, based on the best scientific information available, areas or features where these ecosystems are known to occur, or are likely to occur, and the location of bottom fisheries in relation to these areas or features, taking due account of the need to protect confidential information.”

Article 7-1 (e) states that the Commission shall “adopt conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems in the Convention Area, including but not limited to: measures for conducting and reviewing impact assessments to

determine if fishing activities would produce such impacts on such ecosystems in a given area; measures to address unexpected encounters with vulnerable marine ecosystems in the course of normal bottom fishing activities; and as appropriate, measures that specify locations in which fishing activities shall not occur.”

To date, Japan, Russia, Korea, the US and Canada have completed a report on identification of VMEs and an assessment of impacts caused by bottom fishing activities on VMEs and marine species. The Scientific Committee may build on these reports, which will be kept up to date by respective Parties.

Areas of work

- Review existing NPFC standards on VME data collection, including guidelines set forth in the CMMs for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean (CMM 2021-05 and CMM 2019-06), and determine if any modifications to these standards are needed in the short-term and/or longer term
- Review of Encounter Protocol for bottom fisheries on Vulnerable Marine Ecosystems
- Determination of data requirements and identification of what data may be collected through commercial fishing operations
- Develop consensus on criteria used to identify VMEs and how this might be applied in the NPFC (note that guidelines from the FAO are already referenced in Annex 2 of the CMM 2021-05 and CMM 2019-06)
- Analysis of known or suspected VMEs in the Convention Area
- Visual surveys of VMEs for data collection
- Development of a framework to conduct assessments of Impacts of Bottom Fishing Activities on Vulnerable Marine Ecosystems

3.2.1.1 Review of Encounter Protocol for bottom fisheries on Vulnerable Marine Ecosystems

Rationale

The purposes of VME encounter protocols in NPFC Convention Area include:

- Ensuring early detection and protection of potential VMEs within an existing fishing area;
- Ensuring early detection and protection of potential VME within an unfished area;
- Documenting information on known occurrences of VME indicators within the Convention Area.

Development of the Encounter Protocol progressed through Scientific Committee meetings as well

as intersessional activities. VME encounter protocols are incorporated in the CMMs for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean, specifically in Para 4(g) and 3(j), respectively.

Areas of Work

Consideration of the following subjects of research and analyses are recommended to further refine encounter protocols in the Convention Area (as notified in Appendix C, NPFC01-2016-SSCVME01- Final Report):

- Other taxa, topographical, geographical and geological features that may indicate the presence of VMEs;
- Taxon-specific encounter thresholds and reporting;
- Framework for evaluating the effectiveness of encounter protocols;
- Tiered approach with different encounter protocols associated with different thresholds;
- Gear-specific thresholds to reflect differences in catchability;
- Gear-specific move-on distances to reflect type of gear;
- Different reporting requirements for different catches;
- Tiered approach to reporting bycatch of VME indicator taxa;
- Different encounter protocols for existing and new fishing areas

3.3 Data collection, management and security

Rationale

Article 10, paragraph 4 (i) in the Convention states that the functions of the Scientific Committee shall be to: “develop rules and standards, for adoption by the Commission, for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area”.

Areas of work

- Review of data standards related to stock assessments and other relevant data, including VME data collection and vessel monitoring systems
- Identify data sources to meet data needs for priority areas of work above and develop programs for data collection
- Develop data security policy including data handling and sharing protocol, information

confidentiality classification and access control security guideline

4.0 IMPLEMENTATION AND REVIEW

The SC will review the Research Plan and update it as necessary on an annual basis. The Research Plan will form the foundation of SC's rolling five-year Work Plan. Monitoring the implementation of this Research Plan will be the responsibility of the Chair of the Scientific Committee in collaboration with the Chairs of the Scientific Committees' subsidiary groups and the Executive Secretary. Members of the Commission and the Secretariat will share responsibility for implementation of the Research Plan.

Full implementation of the Research Plan will likely be beyond the means of the Commission's core budget. Extra-budgetary funds from voluntary contributions of Members and other sources will be required and actively sought by the Commission. Nevertheless, adoption of the Plan by the Scientific Committee and subsequent strong support from the Commission is a prerequisite to securing the necessary extra-budgetary funds.

An independent external review of the Plan may periodically be requested by the SC. The Scientific Committee will be responsible for preparing the terms of reference for the review. The Scientific Committee will present the report of the review to the next regular session of the Commission.

5.0 SCIENTIFIC COLLABORATION WITH OTHER ORGANIZATIONS

While not included as a priority, *Article 21* of the Convention addresses cooperation with other organizations or arrangements. It calls on the Commission to cooperate, as appropriate, on matters of mutual interest with the Food and Agriculture Organization (FAO), other specialized agencies of the FAO and relevant Regional Fisheries Management Organizations (RFMOs). Further, the Commission is called on to develop cooperative working relationships, including potential agreements, with intergovernmental organizations that can contribute to its work.

Article 10 also speaks to this issue in clauses five and six, stating that the Scientific Committee may exchange information on matters of mutual interest with other relevant scientific organizations or arrangements, and that the Committee shall not duplicate the activities of other scientific organizations and arrangements that cover the Convention Area.

The impetus to collaborate is made stronger by the prospect of limited research funding in the Commission, at least in the short-term, but it is also in the best interests of the Commission to seek synergies with other organizations with mutual interests and similar membership (e.g. North Pacific

Marine Science Organization (PICES) and North Pacific Anadromous Fish Commission (NPAFC)).

Activities could include:

- Evaluate reports of International Organizations that may be relevant to the functioning of the Scientific Committee
- Identify other organizations with relevant mandates and activities
- Formalize relationships with these organizations (e.g. MOUs, standing invitations to meetings)
- Identify potential funding opportunities

Five-Year Work Plan of the Scientific Committee and its subsidiary bodies

Small Scientific Committee on Pacific Saury (SSC PS)

Priority list:

1. Conduct a stock assessment update based on BSSPM analyses
2. Further investigate improvements to the BSSPM
3. Develop an age/size-structured model
4. Develop a list of plausible ranges for biological parameters
5. Develop databases to support age/size-structured models
6. Continue joint CPUE work to incorporate broader spatial and temporal coverage
7. Update the biomass estimate using the existing method (swept area method)
8. Develop spatio-temporal model for the biomass estimate
9. Further refine the catchability coefficient of the Japanese survey and characterize its variance
10. Develop a longer-term roadmap for work related to Pacific saury stock assessment
11. Set biological reference points
12. Support any technical work on MSE under SWG MSE PS

[H] and [M] indicate high and medium priorities. Cells with “TBD” depend on the progress of data preparation and analytical works.

ITEM	2022	2023	2024	2025	2026
Regular update of inputs					
Update & improvement of biomass survey index	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues	Continue regular review [H] of 1) survey plan 2) analytical work 3) any related issues including experiments to produce absolute biomass index and additional surveys by other Members to increase coverage	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]
Update & improvement of CPUE indices	Continue review of outcomes of regular update and analytical works [H]	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]
Development of joint CPUE index	Continue review of outcomes of regular update and analytical works [H]	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]
Regular update of the existing SA					
Routine update BSSPM as a benchmark	Continue review of outcomes of regular BSSPM update [H]	Same as on the left [H] ¹⁾	Same as on the left [H] ¹⁾	Same as on the left [H] ¹⁾	Same as on the left [H] ¹⁾
Improvement and further investigation of BSSPM	Review any outcomes of improvements, inter alia in light of possible incorporation of environmental information [H]	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]	Same as on the left [H]
Toward age/size-structured models (ASSMs)					
Data inventory (CPUE	Continue update of data	TBD ²⁾	TBD ²⁾	TBD ²⁾	TBD ²⁾

ITEM	2022	2023	2024	2025	2026
and size/age in space and time)	for stock assessment with ASSMs [H]				
Summarizing available information on PS biology	Continue update of information for stock assessment with ASSMs [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾	TBD ²⁾
Development of models	Finalize models and results of analyses by ASSMs [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾	TBD ²⁾
Uncertainty in models (possible link with OM grid under MSE)	Finalize the procedure of assessing model uncertainty [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾	TBD ²⁾
Examination of estimation performance and finalization of models	Finalize simulation works [H]	TBD ²⁾	TBD ²⁾	TBD ²⁾	TBD ²⁾

¹⁾ As a backup method as well as an underlying assessment method used in a management procedure, it seems sensible to keep this as one of reference assessment models.

²⁾ These items might be re-structured depending on the progress of preparation of data and biological information as well as the development of models.

Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

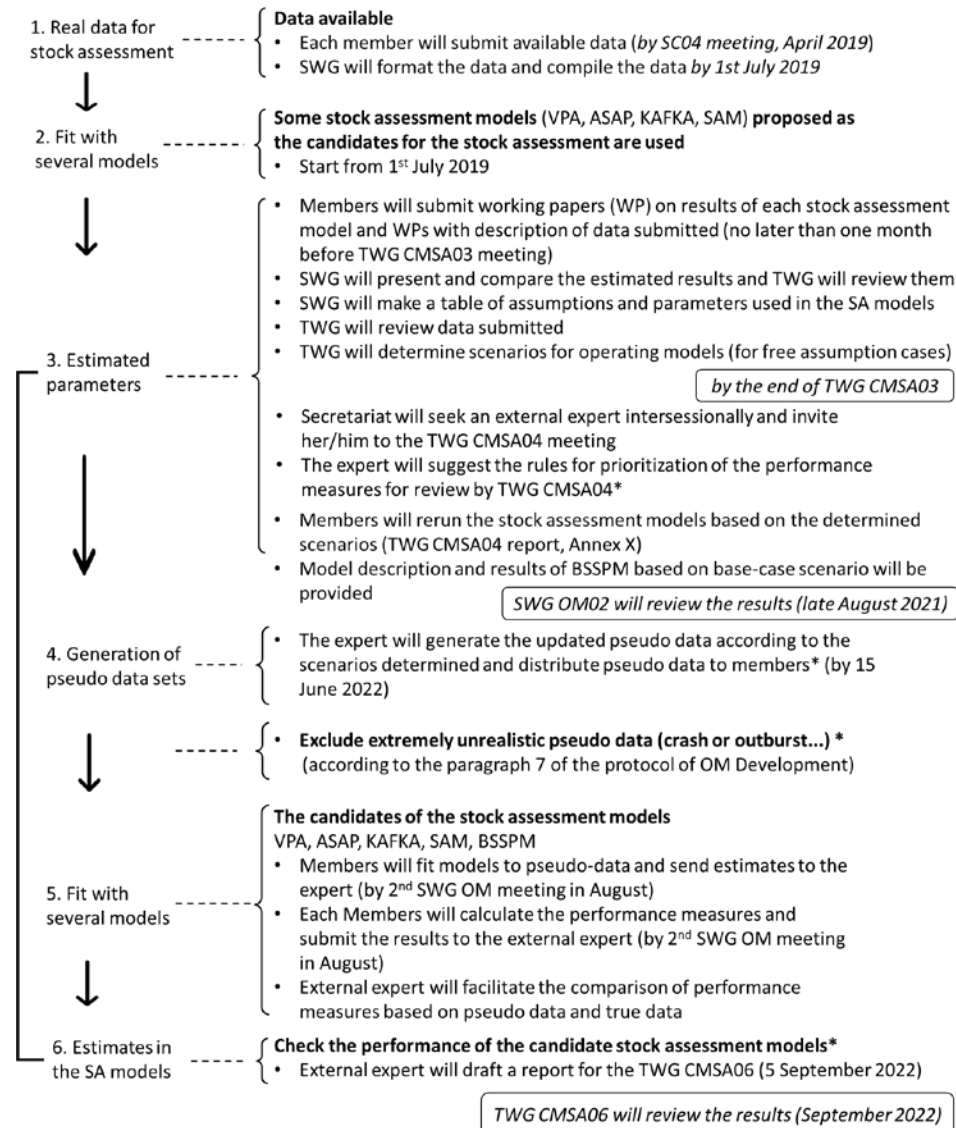
Priority list:

1. Data preparation and review of biological information
2. Develop an operating model
3. Test stock assessment models (VPA, ASAP, KAFKA, SAM, state-space production model)
4. Conduct stock assessment of chub mackerel
5. Set biological reference points
6. Provide scientific advice on the management of chub mackerel stock to the Commission
7. Regularly update and refine inputs

ITEM	2022 autumn	2023 1 st half	2023 2 nd half	2024	2025	2026
Regular update of inputs						
Research survey indices	Review (Finalize) the data used for the stock assessment	Finalize the data used for the stock assessment	Update	Update	Update	Update
CPUE indices	Review standardized CPUE indices for stock assessment	Finalized CPUE standardization	Update	Update	Update	Update
Catch data/catch composition	Review the data used for the stock assessment	<ul style="list-style-type: none"> • Finalize the data used for the stock assessment • Submit historical annual CAA data 	Update	Update	Update	Update
Biological parameters (maturity, M, weight)	Determine the range of assumption for preliminary stock assessment	Finalize assumptions for the stock assessment	Review biological parameters	Review biological parameters	Review biological parameters	Review biological parameters
Quarterly fishery data (CAA, WAA, Maturity-at-age)		<ul style="list-style-type: none"> • Summit quarterly fishery data • Share and standardize age-counting rule 				
Operating model (OM)						

ITEM	2022 autumn	2023 1 st half	2023 2 nd half	2024	2025	2026
Development of operating model						
Testing stock assessment models	<ul style="list-style-type: none"> Determine how to rank the stock assessment model candidates based on the performance measures Choose the best SA model(s) 	<ul style="list-style-type: none"> Determine performance measures/metrics to choose the best SA model(s) Determine how to rank the stock assessment model candidates based on the performance measures Choose the best SA model(s) 				
Stock assessment						
Benchmark stock assessment		<ul style="list-style-type: none"> Determine the method for future projection Conduct preliminary stock assessment with the selected model (intersessionally after TWG CMSA07) 	Complete stock assessment with the selected SA model(s)	Update SA model	Update SA model	
Improvement and further investigation of the selected model				Review and improve, if needed, the SA model	Review and improve, if needed, the SA model	Review and improve, if needed, the SA model
Toward development of reference points						
Set biological reference points (limit and target)		<ul style="list-style-type: none"> Review RPs report Develop a short list of reference points Compare robustness of reference points 	Choose reference points	Review reference points		

Flowchart for the development of operating models and testing stock assessment models



* By an external expert

Small Scientific Committee on Bottom Fish and Marine Ecosystems (SSC BF-ME)

Priority list:

1. NPA and SA: Develop catch and CPUE time series for commercial fisheries
2. NPA: Review survey
3. NPA: Conduct comprehensive stock assessment and provide management advice
4. SA: Conduct comprehensive stock assessment and provide management advice
5. NPA, SA and Sablefish: Develop and implement harvest control rule
6. Sablefish: Evaluate historical harvest relative to trip limits and update trip limits if necessary
7. Sablefish and VME: Conduct trade-off analysis between commercial fishing and VME protection
8. VME: Develop a process for establishing quantitative definitions of VMEs
9. VME: Develop standardized approach to SAI determination

ITEM	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)	SSC BFME07 (2026)
North Pacific Armorhead					
Assess and monitor status of stock	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA	Update catch data and CPUE index for NPA
	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys	Review results of NPA monitoring surveys
	Life history based DLM approach	Implement alternative methods for stock status	Update status of stock	Update status of stock	Update status of stock
	Review acoustic survey and research	Compare CPUE and acoustic estimates			

Annex I: SC07 Report

ITEM	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)	SSC BFME07 (2026)
	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA	Identify and conduct additional research on NPA
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice
Conserve stock		Develop conservation objective(s)			
		Implement adaptive management			
	Refine harvest control rule if needed	Develop HCR and implement	Update data and implement HCR	Update data and implement HCR	
Splendid alfonsino					
Assess and monitor status of stock	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA	Update catch data and CPUE index for SA	
	DLM approach life history	Update comprehensive stock assessment or data limited approach, and provide management advice	Update comprehensive stock assessment or data limited approach, and provide management advice	Update comprehensive stock assessment or data limited approach, and provide management advice	

Annex I: SC07 Report

ITEM	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)	SSC BFME07 (2026)
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	
Conserve stock		Develop conservation objective(s); Define and implement harvest control rule	Update data and implement HCR	Update data and implement HCR	
Sablefish					
Assess and monitor status of stock	Update catch data and CPUE index	Update catch data and CPUE index	Update catch data and CPUE index	Update catch data and CPUE index	Update catch data and CPUE index
	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish	Provide an update on USA-Canada stock assessment models for Sablefish and joint research on Sablefish
	Review fisheries observer program data collection for adequacy to produce data	Review fisheries observer program data collection for adequacy to produce data	Review fisheries observer program data collection for adequacy to produce data	Review fisheries observer program data collection for adequacy to produce data	Review fisheries observer program data collection for adequacy to produce data

Annex I: SC07 Report

ITEM	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)	SSC BFME07 (2026)
	streams to support management advice	streams to support management advice	streams to support management advice	streams to support management advice	streams to support management advice
Conserve stock	Update catch limits relative to stock status	Update catch limits relative to stock status			
Other research	Conduct analysis of sablefish associations with VME (intersessional)				
	Conduct trade-off analysis for Sablefish fishing and VME protection (intersessional)	Update trade-off analysis for Sablefish fishing and VME protection (as new data is available)			
Vulnerable marine ecosystems					
Defining and Identifying VMEs	Bring together VME indicator taxa observation data from various sources and map for NPFC area	Bring together VME indicator taxa observation data from various sources and map for NPFC area			

Annex I: SC07 Report

ITEM	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)	SSC BFME07 (2026)
	Determine a quantitative definition of VMEs	Review and update quantitative definition of VMEs			
Identifying and defining SAI's	Determine data requirements and resolution for SAI assessment	Apply the standardized approach for SAI assessments and conduct integrated SAI assessment	Conduct integrated SAI assessment	Conduct integrated SAI assessment	Conduct integrated SAI assessment
	Discuss VME indicator taxa and whether species/taxa should be added/subtracted	Review updated taxonomy for corals relative to VME indicator taxa			
Quantifying interactions between fisheries and VMEs	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data	Update spatially explicit fishing effort data
	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice	Review fisheries observer program data collection for adequacy to produce data streams to support management advice

Annex I: SC07 Report

ITEM	SSC BFME03 (2022)	SSC BFME04 (2023)	SSC BFME05 (2024)	SSC BFME06 (2025)	SSC BFME07 (2026)
Conserving VMEs	Develop management objectives for recovering VME sites	Develop management objectives for recovering VME sites (lower priority)	Periodic review of VME management	Periodic review of VME management	Periodic review of VME management
	Literature review on impacts and impact rates by fishing gears				
Other ecosystem components					
	Publication of fish ID guide for scientific observers in the NW Pacific Ocean				

Scientific Committee (SC)

Priority list

As stipulated in the Convention, Article 10, the Scientific Committee shall provide scientific advice and recommendations to the Commission which is considered the highest priority task of the SC. The following priority areas have been identified for SC:

1. Priority species summaries and stock assessments for management advice
2. Management Strategy Evaluation (MSE) for priority species
3. Ecosystem approach to fisheries management: understand ecological interactions among species and impacts of fishing on fisheries resources and their ecosystem components
4. Collaboration with other organizations
5. Regular review of the research plan and work plan
6. Data collection, management, and security

ITEM	2022	2023	2024	2025	2026
Priority Species					
Summaries of priority species	Draft summary sheet	Update summary sheets as needed	Update summary sheets as needed	Update summary sheets as needed	Update summary sheets as needed
Assessment of Blue (Spotted) Mackerel and associated bycatch	Collate data Compile data on the catch composition of Chub Mackerel and Blue Mackerel	Collate data Develop data collection templates and share data	Collate data Determine spatial structure of stocks Undertake baseline stock assessment and provide management advice	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules

Annex I: SC07 Report

ITEM	2022	2023	2024	2025	2026
			including harvest control rules	Collate data on associated bycatch species	Assess impacts of fishery on dependent or associated species
Assessment of Japanese Sardine and associated bycatch	Collate data Develop data collection templates and share data	Collate data Determine spatial structure of stocks Undertake baseline stock assessment and provide management advice including harvest control rules	Collate data Undertake baseline stock assessment and provide management advice including harvest control rules	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules Collate data on associated bycatch species	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules Assess impacts of fishery on dependent or associated species
Assessment of Neon Flying Squid and associated bycatch	Collate data Develop data collection templates Determine spatial structure of stocks	Collate data Undertake baseline stock assessment and provide management advice including harvest control rules	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules Collate data on associated bycatch	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules

ITEM	2022	2023	2024	2025	2026
			species	Collate data on associated bycatch species	Assess impacts of fishery on dependent or associated species
Assessment of Japanese Flying Squid and associated bycatch	Collate data Develop data collection templates	Collate data Determine spatial structure of stocks	Collate data Undertake baseline stock assessment and provide management advice including harvest control rules Collate data on associated bycatch species	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules Develop baseline stock assessment of associated bycatch species	Collate data Update baseline stock assessment as needed and provide management advice including harvest control rules Assess impacts of fishery on dependent or associated species
Management Strategy Evaluation (MSE)					
Pacific Saury	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals	Support NPFC's SWG MSE PS in achieving its goals
Ecosystem approach to fisheries management					
Ecological Interactions	Understand ecological interactions among	Understand ecological interactions among	Understand ecological interactions among	Understand ecological interactions among	Understand ecological interactions among

ITEM	2022	2023	2024	2025	2026
	species in the North Pacific Ocean	species in the North Pacific Ocean	species in the North Pacific Ocean	species in the North Pacific Ocean	species in the North Pacific Ocean
Impacts of fishing on ecosystem component	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards	Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species and discards
Collaboration with other Organizations					
PICES	Review implementation of NPFC-PICES Framework for Collaboration Review ICES-PICES WGSPF activities Review PICES WG43 activities	Review implementation of NPFC-PICES Framework for Collaboration Identify other opportunities for collaboration with PICES. Review PICES WG43 activities Review NPFC-PICES	Review implementation of NPFC-PICES Framework for Collaboration Identify other opportunities for collaboration with PICES	Review implementation of NPFC-PICES Framework for Collaboration Identify other opportunities for collaboration with PICES	Review implementation of NPFC-PICES Framework for Collaboration Identify other opportunities for collaboration with PICES

ITEM	2022	2023	2024	2025	2026
		workshop on VME indicator identification			
FAO		Review NPFC's involvement in the 2nd Phase of the GEF-FAO Common Oceans Programme	Review NPFC's involvement in the 2nd Phase of the GEF-FAO Common Oceans Programme	Review NPFC's involvement in the 2nd Phase of the GEF-FAO Common Oceans Programme	Review NPFC's involvement in the 2nd Phase of the GEF-FAO Common Oceans Programme
NPAFC	Review work plan to implement NPFC/NPAFC Memorandum of Cooperation Review NPAFC- NPFC multinational survey program	Undertake scientific activities to achieve relevant deliverables of the work plan	Undertake scientific activities to achieve relevant deliverables of the work plan	Undertake scientific activities to achieve relevant deliverables of the work plan	Undertake scientific activities to achieve relevant deliverables of the work plan
Other organizations	Review collaborations with other organizations	Review collaborations with other organizations	Review collaborations with other organizations	Review collaborations with other organizations	Review collaborations with other organizations
Research and Work Plans					
Terms of Reference	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed	Review SC's Terms of Reference, as needed

Annex I: SC07 Report

ITEM	2022	2023	2024	2025	2026
Research Plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan	Update SC's rolling 5-year research plan
Work Plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan	Update SC's rolling 5-year work plan
Projects	Review completed and ongoing projects Identify and prioritize new projects and recommend sources of funding	Review completed and ongoing projects Identify and prioritize new projects and recommend sources of funding	Review completed and ongoing projects Identify and prioritize new projects and recommend sources of funding	Review completed and ongoing projects Identify and prioritize new projects and recommend sources of funding	Review completed and ongoing projects Identify and prioritize new projects and recommend sources of funding
Data Management					
	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy	Review data standards in relation to stock assessment of priority species Discuss need for additional sources of data for scientific analyses and associated data management policy
Recommendations					
Advice	Develop	Develop	Develop	Develop	Develop

Annex I: SC07 Report

ITEM	2022	2023	2024	2025	2026
	recommendations for the Commission, TCC, and FAC	recommendations for the Commission, TCC, and FAC	recommendations for the Commission, TCC, and FAC	recommendations for the Commission, TCC, and FAC	recommendations for the Commission, TCC, and FAC
Media Communication					
Press Release	Prepare and publish a press release about SC activities during its meeting	Prepare and publish a press release about SC activities during its meeting	Prepare and publish a press release about SC activities during its meeting	Prepare and publish a press release about SC activities during its meeting	Prepare and publish a press release about SC activities during its meeting

**6th Technical and Compliance Committee Meeting
REPORT**

18-21 March 2023

March 2023

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North Pacific Fisheries Commission
6th Meeting of the Technical and Compliance Committee

18-21 March 2023

REPORT

Agenda Item 1. Opening of the Meeting

1.1 Welcome to Participants

1. The 6th Meeting of the Technical and Compliance Committee (TCC) took place as a hybrid meeting in Sapporo and via WebEx, and was attended by Members from Canada, China, European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Panama attended as a Cooperating Non-Contracting Party (CNCP).

1.2 Selection of Meeting Chair

2. Noting that there is no current Chair of TCC, the Executive Secretary proposed that the interim Vice-Chair of TCC, Ms. Alisha Falberg (USA) serve as the Chair for this meeting.
3. All Members agreed to this proposal.

1.3 Appointment of Rapporteur

4. Dr. Shelley Clarke was appointed rapporteur for TCC06.

1.4 Introduction of Observers

5. The Australian National Centre for Ocean Resources , (ANCORS), Organization for Regional and Inter-regional Studies (ORIS) - Waseda University, PEW Charitable Trusts and the IMCS Network were welcomed as accredited observers to the meeting.

1.5 Adoption of Agenda

6. The agenda as presented in NPFC-2023-TCC06-MIP02, and annotated in NPFC-2023-

TCC06-MIP03 rev3, was adopted (**Annex A**). The List of Documents and the List of Participants are attached as **Annex B** and **Annex C**.

1.6 Meeting Arrangements

7. NPFC Compliance Manager, Ms. Judy Dwyer, outlined the meeting arrangements detailed in NPFC-2023-TCC06-MIP01.

Agenda Item 2. Report from the Secretariat

2.1 Fisheries Overview

8. The Compliance Manager presented a brief overview of fisheries (NPFC-2023-TCC06-IP01). Pacific saury is characterized as declining, mackerel are showing consistent catches, squid catches are slightly increasing, Japanese sardine fisheries' catches are increasing perhaps due to a range extension, and bottom fisheries (i.e. armorhead and splendid alfonsino) are generally declining.
9. Members thanked the Secretariat for the presentation but requested that future TCC fisheries overviews show tables rather than figures only. In particular, TCC06 requested that future fisheries overview information papers include more details and analysis of the number of authorized versus active vessels, effort limits, and integration of information on catch amounts with spatial catch information and species summary data available to the Scientific Committee and other relevant information. Some Members expressed their concerns regarding the increase in effort in recent years in the chub mackerel fishery in the Convention Area as shown in Figures 7-9 of the fisheries overview paper. These Members requested that the matter is considered under the Compliance Monitoring Review process and other agenda items.
10. The Compliance Manager stated that the overview covers the period from establishment of the Commission (i.e. since 2015) to the present but noted that in some cases, data quantity and quality has changed over time with the adoption of new CMMs.

2.2 Transshipment Overview

11. The Compliance Manager presented a brief overview of transshipment activities (NPFC-2023-TCC06-IP08). Under requirements which have been in place since 2015, the Commission receives annual reports from Members on transshipment activities, and an interim measure was developed in 2016 but applies only to bottom fisheries. However, in addition to the annual reports, some Members provide reports on individual transshipments. During the period 2015-2021 a total of 9,000 transshipment operations have been reported covering over 2 million tonnes of fish. Reported positions of

transshipments generally align with positions available from VMS and where this is not the case, anomalies are being investigated. Although there is a direct data entry function for transshipment data, to date it is not well-utilized.

12. TCC06 requested a more detailed analysis be presented in future TCC meetings including, *inter alia*, the number of vessels involved by flag, comparisons of pre-notifications and transshipment reports by flag, quantities of fish transshipped by species, locations of transshipments and alleged violations.
13. Some Members, however, noted the existence of important gaps in data available to the Secretariat, some of which are expected to be remedied through adoption of a new CMM on transshipment.

2.3 *Data Management System Update and Initiatives for 2023*

14. NPFC's Data Coordinator, Mr. Sungkuk Kang presented a brief update on the development of the Commission's data management system as it relates to TCC (NPFC-2023-TCC06-IP02). Topics covered included a "Members Home and Quick Links" section on the top page, access to VMS information for use in HSBI activities, plans to enhance database integration, creation of an E-transshipment notification and declaration section, and improvements to the Vessel Registry and other compliance sections on the website.
15. Members appreciated the Secretariat's ongoing effort to provide additional functionality to the NPFC website and to support them in submitting and accessing relevant information.
16. TCC requested a number of further developments be considered. These included new and easy-to-use features to support the Commission's anticipated transshipment CMM, such as an automatic reporting function, a feature to identify when new or revised documents have been uploaded, a weekly report showing the cumulative catch of Pacific saury by each Member, and additional information (date of listing, flag and date of last information update) for each vessel in the IUU Vessel List.

Agenda Item 3. Review of MCS related issues from SC

17. The Science Manager, Dr. Aleksandr Zavolokin, provided a summary of MCS matters for coordination between the Scientific Committee (SC) and the TCC (NPFC-2023-TCC06-IP06). These included (1) proposed revisions to CMM 2021-05 and CMM 2019-06 for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean; (2) request to the Commission to consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A; and (3) proposed revisions to science-related items of

- the draft Work plan to implement NPAFC/NPFC Memorandum of Cooperation.
18. Regarding the recommendation on encounter thresholds for cold water corals and sponges, Members considered that bottom fishing in the location should cease when either is exceeded (using “or” rather than “and”).
 19. Some Members considered that further consideration of the numeric values of the encounter thresholds and the implications of adopting various effort metrics warranted further consideration.
 20. Members inquired about the process for considering the recommendations and were informed that the paper was presented for TCC’s information and that the Commission would be responsible for consideration of amendments to the relevant CMMs.
 21. **Recommendation 1.** TCC06 recommended that the Scientific Committee’s recommendation on VME encounter thresholds for cold water corals and sponges (NPFC-2023-TCC06-IP06 (referencing CMM2021-05 (para. 4g) and CMM2019-06 (para. 3j)) be amended so that action would be triggered if either is exceeded (i.e. using “or” rather than “and”).

Agenda Item 4. SWG Reports on Progress, Priorities and Recommendations

4.1 *SWG Planning and Development – Report and Recommendations*

22. Amber Lindstedt (Canada), Co-Lead of the TCC SWG-Planning and Development (TCC SWG-PD), presented an annual summary of discussions, decision points and deliverables from the SWG’s 2021-2022 meetings (NPFC-2023-TCC06-IP04). This included work on drafting the data sharing and data security protocol, updating the transshipment CMM, drafting a transparency policy for the TCC, and extending the Compliance Monitoring Scheme (CMS).
23. Members thanked the SWG for their efforts, noting the completion by the SWG of work in three topic areas and their hope for agreement on a new transshipment CMM to conclude the fourth topic.

4.2 *SWG Operations – Report and Recommendations*

24. Patricia DeMille (Canada), Co-Lead of the TCC SWG-Operations (TCC SWG-OP) presented a summary of work completed in 2021/2022 and 2022/2023 (NPFC-2023-TCC06-IP03). Topics covered included completed work on specification of boarding ladder guidelines, a review of vessel registry transition issues and data field updates, review of annexes to the proposed transshipment measure, review of new electronic IUU vessel listing process, and designing a standardized template to request VMS information. Pending work includes advising on responsibilities for vessels under charter,

- definition of “serious violation” across all CMMs, and a review of effort indicators.
25. One Member suggested the SWG to take a more holistic approach to the issue of defining “serious violations”.
 26. One Member questioned whether there are any vessels under charter in the NPFC Convention Area, and as there was no information available to the contrary, suggested work related to chartering arrangements be removed from the TCC Work Plan (see Agenda Item 16).
 27. Some Members queried the definition of “inspection presence” as it relates to the table, noting that the table documents HSBI and yet also contains overflight information.
 28. Members noted two minor corrections to the SWG report’s summary of operations: Japan noted that they did not have shipriders for either 2021 or 2022; and China noted that it did have surface assets in 2022.

Agenda Item 5. IUU Vessel List

5.1 *General Discussion*

29. The Compliance Manager presented the current situation with regard to the NPFC IUU Vessel List, draft IUU Vessel List, and IUU Vessel process, explaining that twelve vessels were proposed for 2022 and another 22 vessels for 2023 (NPFC-2023-TCC06-WP01 rev 1). The existing IUU Vessel List contains 36 vessels, all of which are stateless. For 2022, eleven vessels are nominated for the Provisional IUU Vessel List on the basis of refusing boarding and inspection whereas one is suspected of transshipping without authorization. For 2023, nominations for the Provisional IUU Vessel List are on the basis of refusing boarding (eight vessels), unauthorized transshipment or bunkering (eight vessels), improper vessel marking (seven vessels), failure to report on the VMS (seven vessels), unsafe boarding ladders (six vessels), and mis-reporting (five vessels). It was noted that some vessels are nominated based on more than one issue. Some of the activities highlighted in the 2023 Provisional IUU Vessel List nominations mirror those identified under the Compliance Monitoring Scheme.
30. The Chair reminded Members that the task is to decide which of the 34 nominated vessels should be forwarded to the Commission as the Provisional IUU Vessel List.
31. Members agreed that given the large number of vessels nominated that discussions should be structured around groups of vessels with similar nomination characteristics.

5.2 *Recommendation for Provisional IUU Vessel List to the Commission*

5.2.1 *Vessels Submitted by USA*

32. USA, as the submitting Member, noted that all the vessels it nominated for activities in 2021-2022 related to refusing HSBI. According to the HSBI report, the vessels flagged to China insisted that personal protection equipment (PPE), specifically Tyvek suits, were required for HSBI personnel but this is not a requirement under the HSBI CMM (CMM 2021-09). In the case of another vessel flagged to Russia, the flag State's explanation of the HSBI refusal also referenced COVID-related and other communication issues but also cited other explanations for the circumstances around the refusal and the actions taken by the flag State in response.
33. China, as the Member flagging some of the nominated vessels, responded that the refusals happened under special circumstances of the COVID pandemic. They were ordered by authorities, rather than deciding for themselves to refuse HSBI for the sake of the health and safety of the vessel's crews and HSBI inspectors. China considers that the use of PPE is mandatory under the guidelines "NPFC High Sea Boarding and Inspection in a COVID-19 Environment – Best Practices" and therefore it was appropriate for the vessels to refuse boarding to inspectors not wearing PPE. China also noted that before the pandemic, these vessels accepted Members HSBI activities and during the pandemic, these vessels accepted other Members' HSBI activities who followed strictly the best practice. China further mentioned that with the adjustment of China's domestic COVID-19 policy and the amendment to the best practices, the HSBI in the Convention Area will become smooth.
34. Russia, as the Member flagging some of the nominated vessels, responded that its vessel was operating under government quarantine procedures effective at the time. Russia stated that a misunderstanding arose because of a lack of familiarity with HSBI procedures which had just gone into effect. Russia noted that no other problems with the vessel were found.
35. Some Members noted that some vessels flagged to China had accepted HSBI boardings from USA and other authorized inspectors during the pandemic. These Members stated that the current HSBI CMM (CMM 2021-09) is binding and guidelines for "NPFC High Sea Boarding and Inspection in a COVID-19 Environment – Best Practices" are not binding. Therefore, neither the use of PPE nor any other COVID preventative measure is mandatory, and there is no rationale for any Member to decide unilaterally that failure to use any particular best practice measure is a basis for denying HSBI.

5.2.2 *Vessels Submitted by Japan*

36. A first group of two vessels was introduced by Japan. It noted that both vessels are carrier vessels thought to be transshipping without authorization.
37. Panama, as the flag authority for the two nominated vessels at the time of the

infringement, stated that one of the vessels was de-flagged on 8 February 2023 and fined US\$860,000. Panama informed TCC06 that it supports the listing of this vessel on the Provisional IUU Vessel List. The other vessel is currently under administrative sanction, has been fined US\$735,000, and is not allowed to re-flag or be sold. The authorities also support the listing of this vessel on the Provisional IUU Vessel List.

38. The European Union expressed its strong concern regarding the lack of effective flag State control over these vessels.
39. China provided further information about one of the vessels stating that its registration paperwork had been unexpectedly delayed until after the HSBI. The vessel ceased transshipment immediately, left the area, agreed not to transship in the NFPC Convention Area in the future, and agreed to comply with penalties and fines issued by its flag authorities.
40. A second submission was introduced by Japan. It noted that this vessel refused HSBI even though the inspectors were equipped with PPE. Also, Japan found that the vessel continued to transship despite the fact that it claimed there were four sick crew members onboard and HSBI would endanger the inspectors' health. Japan stated that the vessel failed to continually transmit VMS data.
41. China, as the flag Member of the nominated vessel, clarified that the carrier vessel was authorized to transship and the master never intended to deny HSBI but was simply acting in the interest of health and safety. China stated that misunderstanding and miscommunication between master and inspector led to the so-called refusal. The VMS failure was reported immediately and manual transmission was used.
42. A third group of vessels was introduced by Japan. It presented evidence that these three vessels had transshipped catch with an unauthorized carrier vessel in unconfirmed amounts with discrepancies between logbooks, transshipment reports and catch onboard ranging from 76-231t. Japan stated that during the boarding of one of the vessels, the boarding ladder collapsed.
43. China, as the flag Member of the nominated vessels, stated that the catch discrepancies can be explained by differences in estimating catch weights (e.g. by eye versus after being packed in cartons), and that food supplies, rather than catch, had been transferred. As a result of the incidents, China implemented training in catch estimation and recording, and imposed penalties on the order of US\$100,000 on each of the three vessels for receiving cargo from the unauthorized carrier.
44. Several Members questioned whether the transfer between the unauthorized carrier and the fishing vessels involved fish catch or food supplies; asked for further documentation on the nature and amount of the fines imposed; and/or asked whether the sanctions have been completed and if not, whether the vessels are banned from fishing.
45. A fourth and final group of submissions was introduced by Japan. It noted that these

vessels all showed vessel marking issues such as a discrepancy between the call sign marked on the hull and the call sign shown in the NFPC vessel registry, and some vessels were not transmitting VMS. Also, Japan noted that boarding ladders were found to be inadequate, and some of the vessels received fuel from an unregistered tanker (see Agenda Item 5.2.4).

46. China, as the flag Member of the nominated vessels, responded that vessel marking can become difficult to read through a variety of operational or environmental causes. In addition, China stated that one vessel's IRCS was changed but not updated in databases in a timely manner. China considers that these issues are unintentional and technical in nature and should not be the basis for placing a vessel on the Provisional IUU Vessel List. China ordered them to repaint their identifiers and fined the vessels. China also stated that it had issued a circular regarding boarding ladders after the NPFC boarding ladder guidelines were adopted.
47. Some Members considered that the vessel marking violations may not be serious unless there is evidence that the vessels had intended to disguise their identity. Regarding the contact with the unauthorized tanker, one Member stated it is relevant to know whether the fuel received was used to support fishing activities. Other Members referred to the discussion under Agenda Item 5.2.4.

5.2.3 *Vessels Submitted by Canada*

48. Canada introduced a group of vessels stating that these vessels were not transmitting VMS data and/or had poor or no vessel markings. Canada stated that in one case the vessel had been manually reporting to the FMC, but the data were not provided to the Secretariat until after the vessel was proposed for listing. Canada further noted that in another case the vessel failed to transmit VMS data and had no vessel markings.
49. Russia stated that one of its nominated vessels is a bunkering vessel and is thus not subject to the same requirements as fishing vessels. Russia noted that the VMS reporting issue involved a failure to report automatically to the Secretariat; this has been corrected. Russia further noted that the vessel complied with IMO requirements for vessel marking for tankers.
50. Panama stated that for one of its nominated vessels, the VMS malfunctioned in the transmission between the national VMS center and the Secretariat. Panama also stated that since there was continuous reporting to the national VMS center, the vessel was under the control of national authorities at all times, and these data have now been reported to the Secretariat.
51. With reference to vessels with marking issues, China referred to its previous discussion (see para. 46). China noted that for one of the vessels, there was a gap in VMS

reporting, but the vessel was reporting to national authorities throughout and later all of the missing data were sent to the Secretariat. China committed to working with the Secretariat to improve detection of VMS interruptions in the future.

5.2.4 *Vessels not flagged to a Member*

52. The Compliance Manager explained that one of the nominated vessels is not flagged to a Member or CNCP. The Secretariat wrote to the purported flag State Sierra Leone, which responded that the vessel had been de-flagged in September is now flagged to Palau. The Secretariat then wrote to Palau on 23 January 2023 but no response has been received.
53. The EU informed TCC06 that an EU national has been identified among the beneficial owners of a company related to the vessel, therefore the EU is investigating the case in line with its domestic legislation. The information available suggests that the vessel is currently flagged to Togo under the name RIWA.
54. One Member stated that as the vessel is a tanker, and is not engaged in fishing activities as defined in the NPFC Convention text, it cannot be listed on the Provisional IUU Vessel List.
55. Some Members considered that the NPFC Convention does require the listing of bunkers on the IUU Vessel List if they are operating at sea in direct support of fishing vessels.
56. One Member noted that under current regulations, there is no way for a non-CNCP to place bunkers on the NPFC vessel registry and this had led to a proposal for an amendment to allow this to happen.
57. After reviewing and discussing the details of the 34 vessels on the Draft IUU Vessel List, TCC06 did not include six vessels ((#20), (#23), (#25), (#28), (#32) and (#33)) on the Provisional IUU Vessel List because it considered that the flag Members had taken effective action in response to IUU fishing activities in question.
58. **Recommendation 2.** TCC06 recommended that COM07 consider the Provisional IUU Vessel List (**Annex D**).
59. China stated that it does not support the inclusion of its flagged vessels on the Provisional IUU Vessel List.
60. Panama asked that vessels which no longer fly its flag be listed in the Provisional IUU Vessel list with Panama shown as the previous flag.
61. TCC06 agreed to show Panama as a previous flag State for two of the vessels on the Provisional IUU Vessel List which were flagged to Panama at the time of the incidents for which they were listed, and for which there is no information about their new flag State.

5.3 *Recommendations for amendments to current NPFC IUU Vessel List to the Commission*

62. The Chair invited Members to propose revisions to the current NPFC IUU Vessel List contained in NPFC-2023-TCC06-WP19. The list contains 36 vessels and there is no new information about any of the vessels.
63. **Recommendation 3.** TCC6 did not recommend any proposed changes to the current NPFC IUU Vessel List.

Agenda Item 6. Vessel Monitoring System

6.1 *Secretariat Report and CLS Contract*

64. The Compliance Manager provided a summary report in accordance with the annual reporting requirements of CMM 2021-12 (NPFC-2023-TCC06-IP07). VMS came online in August 2021 and has been successfully implemented despite minor technical issues and some larger interruptions and outages. Expiry of SSL security certificates has been identified as one source of outages but will be minimized by sending reminders to those involved. Ongoing checks of the correlations between transshipment reports and VMS are conducted and anomalies are investigated. The current three-year service contract expires in August 2023 and a two-year extension is planned, however, a 12% increase in cost is expected due to inflation, and exchange rate issues will further increase costs. At present VMS data is shared with Members who have an inspection presence in the Convention Area. However, the provisions of para. 14 c) of the VMS Data Sharing and Data Security Protocol which allow this will expire at the conclusion of COM07 unless a decision is taken to extend them.
65. One Member thanked the Secretariat for the paper but in future requested that it contain more information on where and when reporting gaps have occurred.
66. One Member stated that aerial surveillance does not constitute an inspection presence in the Convention Area and noted that aerial surveillance assets are not registered with the Commission as authorized inspection assets under CMM 2021-09. This Member questioned the basis for sharing VMS data for the purpose of aerial surveillance.
67. Some Members had a different view noting the definition of “inspection presence” in CMM 2021-12 para 1(g), and supported the continued provision by the Secretariat of VMS data to those Members which maintain an inspection presence in the Convention Area via aerial surveillance. These Members suggested it might be valuable to amend CMM 2021-12 to clarify this point. A recommendation to COM07 was later made to task TCC through the proposed TCC Work Plan to develop and include appropriate provisions in the VMS CMM and its data sharing protocol to ensure the provision of VMS data to Members with an aerial inspection presence in the Convention Area to address this issue.

6.2 VMS Data Security Protocol

68. The Chair noted that para. 14 c) of the Data Sharing and Data Security Protocol for VMS Data will expire shortly and invited TCC06 to comment on this issue. The Chair further noted that this protocol was intended to be made an annex to CMM 2021-12 at COM06, but this was unintentionally overlooked.
69. Members noted that there are other proposals for amending CMM 2021-12 that could be incorporated into the same exercise depending on the outcomes of TCC06 discussions.
70. Some Members proposed that para 14 c) could be allowed to expire naturally because the ability to share VMS data derives from para 14 which remains in place.
71. **Recommendation 4.** TCC06 recommends that COM07 renew the Data Sharing and Data Security Protocol for VMS data as it pertains to paragraph 14c. which reads: *“Without prejudice and pursuant to CMM 2017-09, and following the notification process outlined above, the Secretariat shall make VMS data available electronically for the area defined in paragraph 14 b) as it is received, to each Member who has an Inspection Presence in the Convention Area. The provisions of this paragraph shall expire at the end of the next scheduled Commission meeting”* and extend the provision until COM08.
72. **Recommendation 5.** To align the VMS CMM with the acceptance of VMS Data Sharing and Security Protocol by the Commission in 2021 and to incorporate the Protocol into the VMS CCM, as intended, TCC06 recommends to COM07 that the following amendments be made to the VMS CMM:

Data access and use

*13. All VMS data received by the Secretariat shall be treated as confidential information in accordance with NPFC’s Data-Sharing and Data-Security Protocol for Vessel Monitoring System (VMS) Data **in Annex 2.***

*14. ~~Subject to the adoption of~~ **In accordance with** the NPFC’s Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) **in Annex 2** ~~by the Commission,~~ the Secretariat shall provide VMS data:*

(a) By electronic means to a Member who has an inspection presence in the Convention Area; or (b) upon request from a Member to support search and rescue (SAR)

Data sharing and Security Protocol

15. ~~Subject to~~ *In accordance with NPFC's Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) Data in Annex 2, VMS data shall only be accessed and used for the purposes included in this measure or for any other purposes as agreed by the Commission.*

(Note from Secretariat: The updated CMM 2023-12 is NOT annexed to the TCC Report, as further amendments to the CMM were adopted at COM 07. The fully amended CMM 2023-12 can be found in Annex AA to the COM07 report.)

Agenda Item 7. High Seas Boarding and Inspection

7.1 Secretariat Report

73. The Compliance Manager presented the annual report on HSBI (NPFC-2023-TCC06-IP09). There are currently 45 inspection vessels registered for HSBI by five Members. In 2020, due to the pandemic, there were only three inspections with nine violations observed, three of which were identified as serious. In 2021, there were 36 inspections conducted, and a further twelve which were refused. Of the inspections that were conducted, 23 violations were observed (ten related to vessel marking issues and seven related to mis-reporting or non-reporting) of which 13 were serious. In total over the 2018-2022 period, 85 vessels have been inspected during which 87 violations were observed on 49 vessels (28 related to vessel marking, 15 related to mis-reporting or non-reporting, and 13 related to refusal of boarding) of which 20 were serious. The Compliance Manager highlighted three issues for TCC06 consideration: a) expiry of para. 14 c) of the VMS Data Sharing and Data Security Protocol (see Agenda Item 6.2); b) the lack of a mechanism for the Secretariat to be notified if patrols are cancelled; and c) the lack of clarity regarding procedures for aerial surveillance.
74. Members thanked the Secretariat for the report and noted the previous discussion under Agenda Item 5.1 on aerial surveillance issues. It was suggested the future HSBI annual reports include more specifics on which vessels and flag Members were involved.
75. The Secretariat requested clarification on the interpretation of paragraph 31 in the HSBI CMM (2021-09), i.e. whether “Commission” is equivalent to “Secretariat” in the context of transmitting copies of the boarding and inspection reports.
76. **Recommendation 6.** TCC06 recommended to COM07 that in para. 31 of CMM 2021-09 the second instance of the word “Commission” should be replaced with “Secretariat” (**Annex E**).

7.2 Members Reports

77. Noting that more information on HSBI is provided in Member's Annual Reports, and also in Member's submissions for the provisional IUU Vessel List, the United States, Japan, Canada and China presented brief reports of their HSBI activities for 2021 and 2022.
78. The European Union acknowledged the importance of Members' contributions to HSBI.

Agenda Item 8. NPFC Data Sharing and Data Security Protocols (for data other than VMS)

79. The Chair introduced work by the TCC SWG-PD on the NPFC data security protocol which is intended to serve as an overarching document for the NPFC's current Regulations for Management of Scientific Data and Information, and the Data Sharing and Data Security Protocol for VMS Data (NPFC-2023-TCC06-WP25).
80. The document was discussed and amended during TCC06 to produce NPFC-2023-TCC06-WP25 rev2)
81. **Recommendation 7.** TCC06 notes that the text in NPFC-2023-TCC06-WP25 rev2 will undergo further discussion in the margins of COM07 for consideration as a NPFC Data Security Protocol.

Agenda Item 9. Review of Applications for CNCP Status

9.1 *CNCP status of Panama and other applications*

82. The Secretariat explained that the only applicant for CNCP status for 2023/2024 is Panama (NPFC-2023-COM07-WP09, Circular 02-2022 and Circular 15-2023). The application was originally submitted in advance of the scheduled March 2022 Commission meeting, and subsequently updated in October 2022 and again in March 2023. The amount of the voluntary contribution for 2023/2024 has been communicated to Panama (US\$65,000) and Panama has indicated its willingness to pay this amount.
83. Panama supplemented the Secretariat's introduction, indicating that they have actively engaged in NPFC management processes such as the IUU Vessel List and Compliance Monitoring Scheme, and taken several corrective actions in response to requests, and have progressively strengthened their vessel control systems.
84. Some Members considered that beyond confirming submission of information by Panama against all of the requirements (NPFC Rules of Procedures, Rule 10.4 a-e), further assessment is needed to understand whether Panama's commitment to implementing the NPFC CMMs is sufficiently clear and proactive, given the ongoing nature of IUU fishing activities in the Convention Area involving vessels flagged to Panama.
85. Some Members also considered that a decision on the CNCP application of Panama

could not be taken before the completion of discussions on the Compliance Monitoring Report and the assessment of past compliance for Panama, both in the NPFC and in other RFMOs (NPFC Rules of Procedures, Rule 10.6).

86. One Member stated that Panama’s performance relates to its commitment to fully implementing the Commission CMMs and also to the requirements of those CMMs, noting the importance to the Commission of adopting a permanent CMM on transshipment.
87. The EU made the following statement:
“While recognizing the efforts and some progress achieved by Panama in strengthening its MCS capabilities and strengthening flag state control over its flagged vessels, the EU was concerned by the repeated serious infringements by Panama flagged vessels in NPFC (and other RFMOs). In particular, Panamanian flagged vessels committed serious infringements in NPFC in 2021 and 2022, however Panamanian authorities did not detect them proactively but only when other CPCs warned them. Therefore, already this element casts serious doubts over the capabilities of the Panamanian authorities to exercise proper control over their vessels. Moreover, despite the measures taken by the Panamanian authorities once they were informed of the IUU activities, those vessels were able to keep operating. This second element shows a lack of proper enforcement capabilities by the Panamanian authorities over their vessels. Subsequently, there are solid reasons to doubt regarding Panama current ability to exert effective control and enforcement over its flagged vessels, therefore, at this point of time the EU would like to express its strong reservation and reluctance in supporting the renewal of the CNCP status in NPFC. The EU suggested to defer the matter to the Commission for further consideration.”
88. The Executive Secretary clarified that Panama’s original application to renew its CNCP status was submitted in December 2021 in advance of COM07, which was originally planned for March 2022, and contained all the documentation required under 10.4 of the Rules of Procedure.
89. **Recommendation 8.** TCC06 requested further information from Panama, and some additional information was received. TCC06 referred the decision on Panama’s CNCP status to COM07 for its consideration.
90. Panama made the following statement during report adoption process:
“The documentation related to the CNCP application of Panama has been submitted in accordance with rule 10.4 and 10.5 through official letter AG-919-2021, distributed by the NPFC through the circular 002/2022 (Jan 4, 2022) and reiterated through official letter AG-197-

2023, distributed by the NPFC through the TCC meeting documents NPFC-2023-COM07 -WP09 rev1 and circular 015/2023 , additionally during the TCC06 further information was required about sanctions applied to vessels, as well as the certificate of cancellation of one vessel listed in the provisional IUU list and it was provided to the TCC06. Panama reiterates that, additional to the previous requirements, Panama remains at disposition to provide additional and specific requests for any information or clarification members may require.”

Agenda Item 10. Compliance Monitoring Scheme

10.1 Provisional Compliance Monitoring Report for 2020-2021

91. The Compliance Manager presented NPFC-2023-TCC06-WP20 containing the draft Compliance Monitoring Report (CMR). A total of 44 agreed obligations were reviewed covering 11 CMMs selected on the basis that the Secretariat has sufficient information for assessment. Five Members received initial assessments of “non-compliance”; these assessments pertained to refusal of HSBI, vessel marking issues and one incident of unrecorded shark catch. After receiving responses from the Members concerned, only two Members remained with “non-compliance” assessments, both of which were in relation to refusal of HSBI. As this situation depends on the interpretation by Members of the requirements of HSBI COVID-19 guidelines, the Secretariat changed the two remaining “non-compliance” assessments to “potential compliance issue”.
92. Members discussed some examples of specific issues related to the draft CMR (NPFC-2023-TCC06-WP20) including following:
- (a) Confirmation from the Secretariat of the number of incidents involving shark handling (the Secretariat confirmed that there were 2, with one additional case of sharks found that was not reported as a violation);
 - (b) The reason for the apparent inconsistency between the Secretariat’s fishery overview report (NPFC-2023-TCC06-IP01, Table 9) which shows an increase in effort for mackerels and the compliance assessment and compliance status assigned in the CMR under CMM2019-07 01 which requires Members to refrain from expanding effort on chub mackerel;
 - (c) The definition of “substantial” harvests that was applied in the assessment of obligation CMM 2021-11 01;

- (d) How the obligation to remove or withdraw vessels on the NPFC IUU Vessel List from the NPFC Vessel Registry was assessed if the Member has no vessels on the NPFC IUU Vessel List; and
- (e) Draft compliance assessments for vessel markings and HSBI.

93. TCC06 also discussed how the CMS could be improved. Some Members expressed the following points:

- (a) The CMR should not merely be the Secretariat’s assessment of compliance, rather it should be a vehicle for the Secretariat to present information that allows the Commission to assess the compliance of its Members;
- (b) The TCC should focus on clarifying the nature of each obligation to be assessed such as assessing whether flag Members have adopted a binding commitment to implement the obligations, perhaps through a questionnaire to Members, and clarifying the process for assessing compliance related to incidents involving individual vessels under the “Flag State Investigation” process provided by the CMS;
- (c) For each obligation assessed, a clear assessment protocol should be articulated including:
 - i. how to determine whether the obligation is applicable;
 - ii. what data can be applied to the assessment and how to determine whether those data are sufficient for the assessment;
 - iii. if data were deemed insufficient for assessment, an identification of what factors contribute to the data gaps and how those data gaps might be remedied;
 - iv. working definitions of any subjective terms so that assessments can be consistent from year to year; and
 - v. definition of the evaluative criteria applied to decide the compliance rating;
- (d) The CMR should be clearer in distinguishing between obligations that are “not applicable” (not relevant) as compared to those which are “not assessed” (e.g. due to data gaps);
- (e) Timing of reporting, preparation of the draft CMR and the TCC should be considered, and potentially adjusted, to maximize the timeliness and effectiveness of the CMR;
- (f) Analysis and recommendations in “Approaches to Evaluate and Strengthen RFMO Compliance Processes and Performance – A Toolkit and Recommendations” (NPFC-2023-TCC06-IP05) should be considered and applied to the CMS as appropriate.
- (g) The relationship between the NPFC IUU Vessel List and the CMR should be better defined particularly with regard to which violations are most appropriately addressed by each process and any areas of overlap)

94. TCC06 noted the draft CMR for 2021. TCC06 did not adopt the draft CMR for 2021 due to a) several concerns raised by Members regarding the robustness and reliability of the assessments in the draft CMR; b) inconsistencies and lack of information for

supporting some assessments ; and c) the lack of time available to address compliance statuses provided in the report. TCC06 determined that it should focus on developing a more robust CMS during the inter-sessional period based on considerations contained in preceding paragraph.

95. **Recommendation 9.** TCC06 recommended COM07 task TCC with inter-sessional work on the CMS and CMR using the review of the draft CMR as captured in the TCC06 meeting report as a starting point.

10.2 *Expiry of CMM 2019-13 and list of obligations for consideration for the Compliance Monitoring Scheme in 2022*

96. The Compliance Manager introduced issues relating to the expiry of the CMS CMM (2019-13). The scheme was scheduled to expire in November 2022 but was granted a one-year extension by the special meeting of the Commission in October 2022. Another extension can be considered, but CMM 2019-13 contains an annex listing just three obligations to be evaluated in the CMR rather than the 44 obligations used in the 2021 draft CMR.
97. A number of options were developed to propose to the Commission to address the issues identified with the CMS/CMR process.
98. **Recommendation 10:** TCC06 recommends that COM07 consider the following options to address concerns identified within the CMS/CMR process:
- (a) that the CMS be extended for one year while the inter-sessional work on a revised CMS proceeds;
 - (b) that COM07 endorse the list of 44 obligations assessed in the 2021 draft CMR leaving open the possibility to add any obligations arising from new CMMs adopted by COM07; and/or
 - (c) that all CMM clauses containing the word “shall” should be assessed in the CMR with the Secretariat reporting back on a) any data gaps which prevent the assessment of these obligations, and b) any obligations that lack sufficient specificity for objective assessment.

Agenda Item 11. Conservation and Management Measures – New CMMs and Amendments

11.1 *Chub mackerel*

99. The European Union introduced its proposal to amend the chub mackerel CMM (2019-07) and to allocate 20,000t to EU, and review the measure when the stock assessment is finalized (NPFC-2023-TCC06-WP04). The EU also introduced its Fisheries Operation Plan WP05 which is a proposed fishing plan for the EU pelagic trawler and impact assessment for its proposed Chub mackerel fishery (NPFC-2023-TCC06-WP05).

100.Members discussed several concerns with the proposal but did not raise any new technical or compliance concerns per se.

101.TCC06 notes the EU's proposal for chub mackerel without highlighting technical or compliance concerns for the consideration of COM07.

11.2 Amendments to Vessel Registry

102.China introduced its proposal (NPFC-2023-TCC06-WP06) to amend the vessel registry CMM (2021-01) to create an interim register for non-Member vessels supplying fuel to Member or CNCP fishing vessels in the Convention Area.

103.Members discussed several aspects of the proposal including potential ambiguities in how different types of vessels and operations are classified and handled in CMMs. Concerns were raised regarding the potential for non-Members to operate in the Convention Area without being bound to NPFC CMMs.

104.TCC06 noted the proposal to amend the vessel registry CMM will continue to be discussed amongst Members and will be considered by COM07.

11.3 HSBI COVID-19 Guidelines

105.Canada introduced a proposal to update the COVID-19 guidance for HSBI and specifically, to recommend the use of face masks during inspections, in line with current understanding and practice (NPFC-2023-TCC06-WP07 rev 1). Canada proposed that TCC06 recommend to COM07 to adopt this proposed non-binding recommendation, which supersedes all previous HSBI COVID-19 guidelines.

106.Several Members expressed support for the proposal, with some requesting minor clarification and suggesting minimal text adjustments.

107.TCC06 supports Canada's HSBI COVID-19 guidelines proposal in principle, noting that further amendments may be considered by COM07.

11.4 Protection of Sharks

108.Canada presented its proposed CMM to protect sharks in the Convention Area by prohibiting the retention of shark or shark parts and encouraging reporting obligations for incidental encounters and releases (NPFC-2023-TCC06-WP08). USA and the EU are co-sponsors of the proposal.

109.Members discussed whether NPFC fisheries are likely to interact with sharks and whether there is currently sufficient information available to understand what impacts these fisheries might be having on sharks. Some Members advocated taking a precautionary approach while others cautioned against implementing a measure that

might be too broad.

110.TCC06 noted the work on a draft CMM for sharks (NPFC-2023-TCC06-WP08, rev 2) and acknowledged that discussions will continue in the margins of COM07.

11.5 *Pollution Prevention Measures*

111.Canada introduced its proposal to adopt a CMM to reduce marine pollution in the Convention Area (NPFC-2023-TCC06-WP-09).

112.Members expressed support for the proposal while offering some minor amendments.

113.TCC06 generally supported the proposal for a CMM on pollution prevention, noting that discussions will continue as the proposal is submitted to COM07 for consideration.

11.6 *Species-specific reporting*

114.Korea explained its proposal to clarify the obligation of vessels to record and report the catches of Japanese sardine, neon flying squid and Japanese flying squid in the Convention Area (NPFC-2023-COM07-WP06).

115.Members expressed support for Korea’s proposal noting a number of related national data reporting obligations are already in place and appreciating the need to clarify requirements.

116.TCC06 generally supports Korea’s proposal to implement reporting requirements for three pelagic species with the expectation that discussions are ongoing and the draft measure will be considered at COM07.

11.7 *Amendment to Vessel Registry*

117.The TCC SWG-OPs introduced a proposal to remove reference to the “pending IMO #” field from Annex 1 (i) of the NPFC Vessel Registry (NPFC-2023-TCC06-WP11). This confirms that vessels will require an IMO number to register.

118.Members expressed support for this proposal and suggested deleting the outdated reference to 1 January 2020 in the description for this field.

119.**Recommendation 11.** TCC06 supports amendment to the vessel registry requirements to remove the field “pending IMO #” and remove the outdated field description and forwards it to the Commission for consideration (**Annex F**).

11.8 *Transshipments and other Transfer Activities*

120.The TCC SWG-PD presented new draft language for CMM 2016-03 that represents extensive work by the SWG-PD. This document was further discussed and amended

during TCC06 which resulted in NPFC 2023 WP12 rev3

121.**Recommendation 12.** TCC06 reviewed the draft CMM based on the work of the TCC SWG-PD and recommends that COM07 convene a small working group to assist in drafting and finalizing the text of the CMM for COM07's consideration.

11.9 Amendments to VMS Reporting Requirement

122.Japan introduced its proposal to remove mandatory VMS reporting for research vessels and remove requirements to provide course and speed when manually reporting (NPFC-2023-TCC06-WP14).

123.Some Members supported the proposed changes while others questioned whether they are necessary or helpful.

124.TCC06 noted the proposal to amend VMS reporting requirements by Japan and encouraged Japan to work with other Members to further the discussion at COM07.

11.10 Proposal to Suspend At-sea Transshipments

125.Japan introduced its proposal to adopt a temporary ban on transshipment at sea unless COM07 adopts a new CMM on transshipment (NPFC-2023-TCC06-WP15). Japan clarified that its objective was not to prevent transshipment but to ensure that all transshipment is effectively controlled and managed.

126.One Member expressed concern that the proposal would ban vessels operating legally from transshipping, while vessels operating illegally would continue to transship.

127.TCC06 noted the proposal by Japan to ban at sea transshipment unless COM07 adopts a new CMM on transshipment without further discussion with the expectation that discussions will continue at COM07.

11.11 Amendments to VMS CMM re: serious violations

128.Korea provided background to its proposal to revise the VMS CMM to require MTUs to be tamper-proof and clarify that it is a serious violation to intentionally tamper with or disable a VMS unit (NPFC-2023-TCC06-WP16 rev2). Korea is looking for clarity that the guidance contained in the annex to CMM 2021-12 is mandatory and that tampering with an MTU is a serious violation.

129.Members generally shared Korea's reading of the CMM but suggested different approaches to modifying the text.

130.**Recommendation 13.** TCC06 recommends that COM07 task TCC's SWG-OPs with continuing its work to consistently define what constitutes a serious violation across all CMMs.

131.TCC06 notes the proposal by Korea to amend the VMS CMM on the understanding that

Korea will continue to work on the proposal for the consideration of COM07.

11.12 Amendment of the HSBI reporting format

132. Japan explained that this proposal is not changing the elements of the HSBI report, only modifying the format of the report (NPFC-2023-TCC06-WP13).

133. Some Members requested more time to check the new format to ensure that there are no substantive changes.

134. TCC06 noted the proposal by Japan on the HSBI report format modifications and the fact that discussions will be continuing at COM07.

11.13 Climate Change

135. The USA summarized its proposal related to climate change (NPFC-2023-TCC06-WP27 rev1). Korea and Canada are co-sponsoring the proposal.

136. Members supported highlighting the importance of the issue, but some considered that it would be better formulated as a Commission decision or resolution rather than a CMM.

137. TCC06 expressed general support for the proposal on climate change but recommended COM07 to consider whether it should be a CMM or take another form.

11.14 Observer program for transshipments

138. Pew introduced its observer paper on establishing a transshipment observer program (NPFC-2023-TCC06-OP01), highlighting that it reviews the programs at IATTC, ICCAT, IOTC and CCSBT and covers observer training, cross-certification, data reporting and management, costs and cost recovery, and Secretariat roles and responsibilities.

139. TCC06 noted the observer paper from Pew on establishment of a transshipment observer program.

Agenda Item 12. Cooperation with other Organizations

12.1 NPFC-NPAFC Work Plan

140. The Compliance Manager introduced a paper on the Five-Year NPFC-NPAFC Work Plan showing elements of the plan that are relevant to TCC (NPFC-2023-TCC06-WP23). These mainly pertain to reporting/sharing of Pacific salmon bycatch data and other types of information exchange on MCS issues including suspicious (stateless and unregistered) vessels. Members were invited to comment on the Work Plan and if appropriate forward it to COM07.

141. Some Members posed questions about collection of bycatch data on Pacific salmon and about whether the Memorandum of Cooperation (MOC) has financial implications.

142. TCC06 noted the NPFC-NPAFC Work Plan under the NPFC-NPAFC Memorandum of Cooperation and anticipated that it would be discussed further at COM07, potentially with input from NPAFC to guide a decision.

12.2 IMCS Network

143. TCC06 considered an invitation for NPFC to join the IMCS network (NPFC-2023-TCC06-WP21).

144. Noting that the invitation posed no financial obligations, some Members supported joining the network as a useful way of obtaining valuable advice and support particularly when following up on stateless vessels.

145. Some Members posed questions about the proposed relationship and wished to consider the issue further.

146. TCC noted the invitation and referred it to COM07 for further discussion.

12.3 MOUs with SPRFMO and WCPFC

147. The Executive Secretary introduced draft MOUs with SPRFMO (NPFC-2023-TCC06-WP17) and WCPFC (NPFC-2023-TCC06-WP18) noting that a) all NPFC Members are members of one or both of these organizations, b) there are no financial implications associated with signing the MOUs, and c) there are several benefits to be gained by strengthening links with these organizations. TCC06 was invited to consider recommending to COM07 that the Executive Secretary be authorized to sign the MOU with SPRFMO and advance discussions on the MOU with WCPFC.

148. Some Members supported both MOUs in their current form.

149. Other Members questioned the need for one or both of the MOUs, or considered that further work on the text is required.

150. The TCC Chair encouraged Members to assist with re-drafting the MOUs in order to submit a revised version to COM07 for a decision.

Agenda Item 13. Document Rules

13.1 Considerations for Updates to NPFC Document Rules

151. The Executive Secretary presented NPFC-2023-TCC06-WP03 which proposes updates to the document rules to reflect changes to data accessibility via the website/collaboration site. He explained that these changes have implications for the discussion under Agenda Item 13.2 (Rules for Transparency) as it proposes to harmonize

rules for public access to all NPFC documents. The Executive Secretary noted that FAC05 has already endorsed the proposal for the consideration of COM07.

152.TCC06 did not reach consensus on the proposal to update the document rules as presented in NPFC-2023-TCC06-WP03.

153.**Recommendation 14:** TCC06 recommended that work on these issues continue in the margins with a view toward providing consensus text on document access rules for adoption by COM07.

13.2 NPFC Rules for Transparency Pertinent to TCC

154.The SWG-PD Co-lead introduced a paper covering NPFC rules for transparency as they pertain to TCC (NPFC-2023-TCC06-WP10). The content of this paper is the product of the TCC WG-PD and based on discussions held in 2021. It covers observer access to TCC meetings (can be admitted by a simple majority), public access to all meeting documents (treated in accordance with the NPFC Rules of Procedure), and confidentiality of compliance reports (paragraph 21 of CMM 2019-13 for the CMS).

155.The Executive Secretary clarified that under Rule 5 of the Rules of Procedure, NPFC meetings are open by default and under Rule 9, observers are allowed access to meetings of the Commission and its subsidiary bodies.

156.Some Members expressed that the proposal was not needed because transparency is addressed through the NPFC Rules of Procedure, which do not restrict observers from TCC SWG meetings. These Members stated that the existing rules should be followed and that unless the Commission has adopted rules to the contrary, then meetings of the subsidiary bodies and their working groups should be open as a default practice, consistent with the Rules of Procedure.

157.Some Members considered that the proposal represents a useful balance between transparency and confidentiality, embodies a compromise amongst Members with different views, clarifies access of observers to TCC SWG, and can serve as an opportunity to promote trust while allowing access under some circumstances.

158.**Recommendation 15:** TCC06 did not reach consensus on the draft Interim Rules of Transparency of TCC (NPFC-2023-TCC06-WP10) but recommends that work continue in the margins and the document be further considered at COM7.

Agenda Item 14. Draft Report of Performance Review – Recommendations Relevant to TCC

159.Dr Penny Ridings presented the technical and compliance-related findings of the First NPFC Performance Review (NPFC-2023-TCC06-WP26). The Performance Review Panel noted some early successes, including an active HSBI programme, a comprehensive IUU Vessel List, and establishment of VMS and CMS. However,

progress has lagged in some areas such as regulation and monitoring of transshipment and addressing IUU fishing. A total of 19 recommendations with relevance to TCC were presented, touching upon issues ranging from developing a permanent transshipment measure, expanding the observer programme, setting minimum requirements for port State measures, addressing stateless vessels and fishing with long driftnets, transitioning to a CMS based on data sources such as electronic reporting, encouraging non-Members to become CNCPs, and improving transparency with respect to access to documents and observer participation. As these issues are numerous and varied, the Commission would benefit from a clear strategy to help prioritize its work.

160. Members thanked Dr Ridings and the Performance Review Panel for their comprehensive and thorough work.

161. Members were referred to the report of the Performance Review Panel for more details on recommendations pertaining to carrier and bunker vessel activities.

Agenda Item 15. Other Matters

15.1 Consideration of Recommendations for TCC Chair/Vice-Chair

162. Alisha Falberg (USA) was nominated as TCC Chair. Amber Lindstedt (Canada) was nominated as TCC Vice-Chair.

163. **Recommendation 16.** TCC06 recommends to COM07 that Alisha Falberg (USA) serve as TCC Chair and Amber Lindstedt (Canada) serve as TCC Vice-Chair starting at the conclusion of the Commission meeting which appoints them and serving for a two-year term.

15.2 Consideration of EU fisheries operations plan

164. This item was discussed under Agenda Item 11.1.

Agenda Item 16. Review and Endorsement of TCC Work Plan for 2023/2024

165. TCC06 reviewed the TCC/SWG Work Plan for 2023-2024 (NPFC-2023-TCC06-WP22 rev1) against the progress made to date and in consideration of new items of work arising from TCC06.

166. **Recommendation 17:** TCC06 recommended that COM07 task TCC with the activities contained in the Work Plan (**Annex G**) with particular priority attached to work on the observer program related to transshipment, CMS and reconciling serious violations.

167. TCC06 noted that the Secretariat will continue to provide VMS data to Members with an aerial surveillance presence in the Convention Area as in past practice.

Agenda Item 17. Recommendations to the Commission and Adoption of the Report

168. The recommendations to COM07 contained in the report were adopted by consensus.

Agenda Item 18. Next Meeting

169. TCC06 asked COM07 to consider the timing and location of the next TCC meeting, in conjunction with the implications of these decisions for the CMS and ability of TCC to manage its workload.

Agenda Item 19. Adoption of the Report

170. The meeting report was adopted by consensus.

Agenda Item 20. Close of the Meeting

171. TCC06 closed at 15:37 on 21 March 2023.

TCC 06 Annexes

Annex A - Agenda

Annex B – List of Documents

Annex C - List of Participants

Annex D - Provisional IUU Vessel List

Annex E – CMM 2023-09 for High Seas Boarding and Inspection Procedures

Annex F - CMM 2023-01 on Information Requirements for Vessel Registration

Annex G – TCC 2023/24 workplan

Annex A: TCC06 Agenda

North Pacific Fisheries Commission
6th Technical and Compliance Committee Meeting
18-20 March 2023
Sapporo Japan

Agenda

1. Opening of the Meeting
 - a. Welcome to Participants
 - b. Selection of Meeting Chair
 - c. Appointment of Rapporteur
 - d. Introduction of Observers
 - e. Adoption of Agenda
 - f. Meeting Arrangements

2. Report from secretariat
 - a. Fisheries Overview 2021 and 2022
 - b. Transshipment Overview
 - c. Data Management System Update and Initiatives for 2023

3. Review of MCS related issues from SC

4. SWG Reports on Progress, Priorities and Recommendations
 - a. SWG Planning and Development - Report and Recommendations
 - b. SWG Operations - Report and Recommendations

5. IUU Vessel List
 - a. General Discussion
 - b. Recommendation for Provisional IUU Vessel List to the Commission
 - c. Recommendations for amendments to current NPFC IUU Vessel List to Commission

6. Vessel Monitoring System
 - a. Secretariat report
 - b. CLS Contract
 - c. VMS Data Security Protocol

Annex A: TCC06 Agenda

7. High Seas Boarding and Inspection
 - a. Secretariat Report
 - b. Members Reports
8. NPFC Data Sharing and Data Security Protocol
9. Review of Applications for CNCP Status
10. Compliance Monitoring Scheme
 - a. Provisional Compliance Monitoring Reports for 2020 and 2021
 - b. List of obligations for consideration for the Compliance Monitoring Scheme in 2022
 - c. Expiry of CMM 2019-13
11. Conservation and Management Measures - New CMMs and Amendments
12. Cooperation with Other Organizations
 - a. NPFC-NPAFC Work Plan
 - b. Membership to IMCS Network
13. NPFC Rules for Transparency Pertinent to TCC
14. Draft Report of Performance Review- Recommendations relevant to TCC
15. Other Matters
 - a. Consideration of Recommendations for TCC Chair/Vice Chair
 - b. Consideration of EU fisheries operations plan
16. Review and Endorsement of TCC Work Plan for 2023/2024
17. Recommendations to the Commission
18. Next Meeting
19. Adoption of the Report
20. Close of the Meeting

Annex B: TCC06 List of Documents

LIST OF DOCUMENTS**MEETING INFORMATION PAPERS**

Number	Title
NPFC-2023-COM07/TCC06/FAC05-MIP01	Meeting Information
NPFC-2023-TCC06-MIP02	Provisional Agenda
NPFC-2023-TCC06-MIP03 rev3	Annotated Indicative Provisional Agenda

REFERENCE DOCUMENTS

NPFC-2023-COM07-WP09 rev1	Panama – Application for Renewal of Cooperating Non-Contracting Party Status rev1

WORKING PAPERS

Symbol	Title
NPFC-2023-TCC06-WP01 rev1	NPFC Draft IUU Vessel List for 2023
NPFC-2023-FAC05/TCC06-WP03	Secretariat – Considerations for Updates to NPFC Document Rules
NPFC-2023-TCC06-WP04	European Union – Proposal for Amending Conservation and Management Measure for Chub Mackerel (CMM 2019-07)
NPFC-2023-TCC06-WP05	European Union - Fisheries Operation Plan and impact assessment for a Chub mackerel fishery within the NPFC Convention area
NPFC-2023-TCC06-WP06	China- Conservation and Management Measure on Information Requirements for Vessel Registration
NPFC-2023-TCC06-WP07 rev1	Canada - Update to NPFC High Seas Boarding and Inspection Covid-19 Guidance rev 1
NPFC-2023-TCC06-WP08 rev2	Canada - Consideration for the Development of a Measure to Protect Shark Species in the North Pacific Fisheries Commission Convention Area
NPFC-2023-TCC06-WP09 rev1	Canada - Consideration for the Development of a Pollution Prevention Measure for the North Pacific Fisheries

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	Commission Convention Area
NPFC-2023-TCC06-WP10	SWG PD - Interim NPFC Rules of Transparency Pertinent to TCC
NPFC-2023-TCC06-WP11	TCC SWG OPS - Amendments to the Vessel Registry Conservation Management Measure
NPFC-2023-TCC06-WP12 rev3	SWG PD - Revisions to CMM 2016-03 on Transshipments and Other Transfer Activities
NPFC-2023-TCC06-WP13	Japan - Update to the NPFC High Seas Boarding and Inspection Report Form
NPFC-2023-TCC06-WP14	Japan - Proposal to amend the Vessel Monitoring Scheme CMM 2021-12
NPFC-2023-TCC06-WP15	Proposal on a temporary suspension of at-sea transshipment in the Convention Area
NPFC-2023-TCC06-WP16 rev2	Korea - Proposal to amend CMM2021-12 on the Vessel Monitoring System (VMS)
NPFC-2023-TCC06-WP17	Secretariat - TCC Considerations of Draft MOU with SPRFMO
NPFC-2023-TCC06-WP18	Secretariat - TCC Considerations of Draft MOU with WCPFC
NPFC-2023-TCC06-WP19	Current NPFC IUU Vessel List
NPFC-2023-TCC06-WP20	Draft CMR Summary
NPFC-2023-TCC06-WP21	IMCS Network – Invitation for NPFC to join the International Monitoring Control and Surveillance Network
NPFC-2023-TCC06-WP22 rev1	TCC/SWG WORK PLAN 2023-2024
NPFC-2023-TCC06-WP23	Proposed Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation (MOC)
NPFC-2023-TCC06-WP24	Secretariat - Changes to CMS 2019-13
NPFC-2023-TCC06-WP25 rev2	SWG PD - NPFC Data Sharing and Data Security Protocol (data other than VMS)
NPFC-2023-TCC06-WP26	Report of the NPFC Performance Review Panel
NPFC-2023-TCC06-WP27 rev1	USA – Proposal on Climate Change

Annex B: TCC06 List of Documents

INFORMATION PAPERS

Symbol	Title
NPFC-2023-TCC06-IP01	Fishery Overview
NPFC-2023-TCC06-IP02	NPFC Data Management Update and New Initiatives
NPFC-2023-TCC06-IP03	SWG OPS - Small Working Group Operations Summary of Work Completed in 2021/2022 and 2022/2023
NPFC-2023-TCC06-IP04	SWG PD SUMMARY 2021-2022
NPFC-2023-TCC06-IP05	Korea - Approaches to Evaluate and Strengthen RFMO Compliance Processes and Performance – A Toolkit and Recommendations
NPFC-2023-TCC06-IP06	Secretariat - Matters for coordination between SC and TCC
NPFC-2023-TCC06-IP07	VMS Implementation Report
NPFC-2023-TCC06-IP08	Transshipment Summary
NPFC-2023-TCC06-IP09	HSBI Summary 2020-2021

OBSERVER PAPERS

Symbol	Title
NPFC-2023-TCC06-OP01	Pew Charitable Trusts - Transshipment Observer Program
NPFC-2023-TCC06-OP02	An Analysis of AIS-Detected Port Activity in the North Pacific Fisheries Commission's Convention Area 2019-2021
NPFC-2023-TCC06-OP03	Pew Charitable Trusts - transparency
NPFC-2023-TCC06-OP04	Pew Charitable Trusts - Statement
NPFC-2023-TCC06-OP05	Fishing through the Cracks: The Unregulated Nature of Global Squid Fisheries

REPORTS

Symbol	Title
NPFC-2023-Provisional IUU Vessel List	NPFC Provisional IUU Vessel List for COM07
NPFC-2023-TCC06-Final Report	TCC06 Final Report

Annex C: TCC06 List of Participants

**North Pacific Fisheries Commission
6th Meeting of the Technical and Compliance**

18-21 March 2023 JST

Japan

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Annex D: Provisional 2023 IUU Vessel List

PROVISIONAL NPFC IUU VESSEL LIST FOR TCC06

The link to the TCC document "Provisional NPFC IUU Vessel List" is [here](#).

This confidential document was submitted by the TCC06 to the 7th Commission Meeting for consideration.

The final adopted version ("NPFC 2023 IUU Vessel List") is Annex K of the Commission Report.

Annex E: CMM 2023-09 HSBI

CMM 2023-09

(Entered into force dd mm2023)

**CONSERVATION AND MANAGEMENT MEASURE FOR
HIGH SEAS BOARDING AND INSPECTION PROCEDURES FOR THE
NORTH PACIFIC FISHERIES COMMISSION**

1. The following procedures are established by the North Pacific Fisheries Commission, in accordance with Article 7, paragraph 2-c of its Convention, to govern high seas boarding and inspection of fishing vessels in the Convention Area.

Definitions

2. For the purposes of interpreting and implementing these procedures, the following definitions shall apply:
 - a) “Convention” means the Convention on the Conservation and Management of High Seas Fisheries resources in the North Pacific Ocean;
 - b) “Commission” means the North Pacific Fisheries Commission (NPFC) established under Article 5 of the Convention;
 - c) “Authorities of the Inspection Vessel” means the authorities of the Contracting Party under whose jurisdiction the inspection vessel is operating;
 - d) “Authorities of the Fishing Vessel” means the authorities of the Member of the Commission under whose jurisdiction the fishing vessel is operating;
 - e) “Authorized inspection vessel” means any vessel included in the Commission’s register of vessels as authorized to engage in boarding and inspection activities pursuant to these procedures;
 - f) “Authorized inspector” means inspectors employed by the authorities responsible for boarding and inspection included in the Commission register and authorized to conduct boarding and inspection activities pursuant to these procedures;
 - g) “Fishing activity” means the activities established under Article 1 (i) of the Convention;
 - h) “Fishing vessels” means any vessel described under Article 1 (j) of the Convention.

Annex E: CMM 2023-09 HSBI

Purpose

3. Boarding and inspection and related activities conducted pursuant to these procedures shall be for the purpose of ensuring compliance with the provisions of the Convention and conservation and management measures adopted by the Commission and in force.

Area of Application

4. These procedures shall apply throughout the Convention Area, which consists of the high seas areas of the North Pacific Ocean as specified in Article 4 of the Convention.

General Rights and Obligations

5. Each Contracting Party may, subject to the provisions of these procedures, carry out boarding and inspection on the high seas of fishing vessels engaged in or reported to have engaged in a fishery regulated pursuant to the Convention.
6. These procedures shall also apply in their entirety as between a Contracting Party and a Fishing Entity, subject to a notification to that effect to the Commission from the parties concerned.
7. Each Member of the Commission shall ensure that vessels flying its flag accept boarding and inspection by authorized inspectors in accordance with these procedures. Such authorized inspectors shall comply with these procedures in the conduct of any such activities.

General Principles

8. These procedures are intended to implement and give effect to, and are to be read consistently with, Article 7.2.c and Article 17.6 of the Convention.
9. These procedures shall be implemented in a transparent and non-discriminatory manner, taking into account, inter alia:
 - a) such factors as the presence of observers on board a vessel and the frequency and results of past inspections; and

Annex E: CMM 2023-09 HSBI

- b) the full range of measures to monitor compliance with the provisions of the Convention and agreed conservation and management measures, including inspection activities carried out by the authorities of Members of the Commission in respect of their own flag vessels.
 - c) that NPFC Member inspectors are at risk of serious injury during the boarding process and that minimum standards for boarding ladders are to be implemented to the extent possible minimize this risk.
10. While not limiting efforts to ensure compliance by all vessels, priority for boarding and inspection efforts pursuant to these procedures may be given to:
- a) fishing vessels that are not on the NPFC Record of Fishing Vessels and are flagged to Members of the Commission;
 - b) fishing vessels reasonably believed to engage or to have been engaged in any activity in contravention of the Convention or any conservation and management measure adopted thereunder;
 - c) fishing vessels that are entitled to fly the flag of a Member of the Commission that does not dispatch patrol vessels to the area of application to monitor its own fishing vessels;
 - d) fishing vessels without observers on board if so required by the Convention, Article 7.2b;
 - e) fishing vessels with a known history of violating conservation and management measures adopted by international agreement or any domestic laws and regulations.
11. The Commission shall keep the implementation of these procedures under review.
12. The interpretation of these procedures shall rest with the Commission.

Participation

13. The Commission shall maintain a register of all authorized inspection vessels and authorities or inspectors. Only vessels and authorities or inspectors listed on the Commission's register are authorized under these procedures to board and inspect fishing vessels of Commission Members and Cooperating Non-Contracting Parties on the high seas within the Convention Area.

Annex E: CMM 2023-09 HSBI

14. Each Contracting Party that intends to carry out boarding and inspection activities pursuant to these procedures shall so notify the Commission, through the Executive Secretary, and shall provide the following:
- a) with respect to each inspection vessel it assigns to boarding and inspection activities under these procedures:
 - i) details of the vessel (name, description, photograph, registration number, port of registry (and, if different from the port of registry, port marked on the vessel hull), international radio call sign and communication capability);
 - ii) An example of the credentials issued to the inspectors by its authorities;
 - iii) notification that the inspection vessel is clearly marked and identifiable as being on government service;
 - iv) notification that the crew has received and completed training in carrying out boarding and inspection activities at sea in accordance with any standards and procedures as may be adopted by the Commission.
 - b) with respect to inspectors it assigns pursuant to these procedures:
 - i) the names of the authorities responsible for boarding and inspection;
 - ii) notification that such authorities' inspectors are fully familiar with the fishing activities to be inspected and the provisions of the Convention and conservation and management measures in force; and
 - iii) notification that such authorities' inspectors have received and completed training in carrying out boarding and inspection activities at sea in accordance with any standards and procedures as may be adopted by the Commission.
15. Where military vessels are used as a platform for the conduct of boarding and inspection, the authorities of the inspection vessel shall ensure that the boarding and inspection is carried out by inspectors fully trained in fisheries enforcement procedures and duly authorized for this purpose under national laws, and that boardings from such military vessels and inspectors conform to the procedures contained within these Boarding and Inspection Procedures.
16. Authorized inspection vessels and inspectors notified by Contracting Parties pursuant to paragraph 14 shall be included on the Commission register once the Executive Secretary confirms that they meet the requirements of that paragraph.

Annex E: CMM 2023-09 HSBI

17. To enhance the effectiveness of the Commission's boarding and inspection procedures, and to maximize the use of trained inspectors, Contracting Parties may identify opportunities to place authorized inspectors on inspection vessels of another Contracting Party. Where appropriate, Contracting Parties should seek to conclude bilateral arrangements to this end or otherwise facilitate communication and coordination between them for the purpose of implementing these procedures.
18. The Executive Secretary shall ensure that the register of authorized inspection vessels and authorities or inspectors is at all times available to all Members of the Commission and shall immediately circulate any changes therein. Updated lists shall be posted on the Commission website. Each Member of the Commission shall take necessary measures to ensure that these lists are circulated in a timely manner to each of its fishing vessels operating in the Convention Area.

Procedures

19. The Commission shall develop an NPFC inspection flag, which shall be flown by authorized inspection vessels, in clearly visible fashion.
20. Authorized inspectors shall carry an approved identity card identifying the inspector as authorized to carry out boarding and inspection procedures under the auspices of the Commission and in accordance with these procedures.
21. An authorized inspection vessel that intends to board and inspect a fishing vessel on the high seas that is engaged in or reported to have engaged in a fishery regulated pursuant to the Convention shall, prior to initiating the boarding and inspection:
 - a) make best efforts to establish contact with the fishing vessel by radio, by the appropriate International Code of Signals or by other accepted means of alerting the vessel;
 - b) provide the information to identify itself as an authorized inspection vessel - name, registration number, international radio call sign and contact frequency;
 - c) communicate to the master of the vessel its intention to board and inspect the vessel under the authority of the Commission and pursuant to these procedures; and
 - d) initiate notice through the authorities of the inspection vessel of the boarding and inspection to the authorities of the fishing vessel.

Annex E: CMM 2023-09 HSBI

22. In carrying out boarding and inspection pursuant to these procedures, the authorized inspection vessel and authorized inspectors shall make their best efforts to communicate with the master of the fishing vessels in a language that the master can understand. In order to facilitate communications between the inspectors and the master of the vessel, the Commission shall develop a standardized multi-language questionnaire, which shall be circulated to all Contracting Parties with authorized inspection vessels.
23. Authorized inspectors shall have the authority to inspect the vessel, its license, gear, equipment, records, facilities, fish and fish products and any relevant documents necessary to verify compliance with the conservation and management measures in force pursuant to the Convention.
24. Boarding and inspection pursuant to these procedures shall:
- a) be carried out in accordance with internationally accepted principles of good seamanship so as to avoid risks to the safety of fishing vessels and crews;
 - b) be conducted as much as possible in a manner so as not to interfere unduly with the lawful operation of the fishing vessel;
 - c) take reasonable care to avoid action that would adversely affect the quality of the catch; and
 - d) not be conducted in such manner as to constitute harassment of a fishing vessel, its officers or crew.
25. In the conduct of a boarding and inspection, the authorized inspectors shall:
- a) present their identity card to the master of the vessel and a copy of the text of the relevant measures in force pursuant to the Convention in the relevant area of the high seas;
 - b) not interfere with the master's ability to communicate with the authorities of the fishing vessel;
 - c) complete the inspection of the vessel within 4 (four) hours unless evidence of a serious violation is found;
 - d) collect and clearly document any evidence they believe indicates a violation of measures in force pursuant to the Convention;
 - e) provide to the master prior to leaving the vessel a copy of an interim report on the boarding and inspection including any objection or statement which the master wishes to include in the report;
 - f) promptly leave the vessel following completion of the inspection if they find no evidence of a serious violation; and

Annex E: CMM 2023-09 HSBI

- g) provide a full report on the boarding and inspection to the authorities of the fishing vessel, pursuant to paragraph 31, which shall also include any master's statement.

26. During the conduct of a boarding and inspection, the master of the fishing vessel shall:

- a) follow internationally accepted principles of good seamanship so as to avoid risks to the safety of authorized inspection vessels and inspectors;
- b) accept and facilitate prompt and safe boarding by the authorized inspectors;
- c) be encouraged to provide a boarding ladder in accordance with Annex A;
- d) cooperate with and assist in the inspection of the vessel pursuant to these procedures;
- e) not assault, resist, intimidate, interfere with, or unduly obstruct or delay the inspectors in the performance of their duties;
- f) allow the inspectors to communicate with the crew of the inspection vessel, the authorities of the inspection vessel, any embarked observers, as well as with the authorities of the fishing vessel being inspected;
- g) provide the inspectors onboard with reasonable facilities, including, where appropriate, food and accommodation; and
- h) facilitate safe disembarkation by the inspectors.

27. If the master of a fishing vessel refuses to allow an authorized inspector to carry out a boarding and inspection in accordance with these procedures, such master shall offer an explanation of the reason for such refusal. The authorities of the inspection vessel shall immediately notify the authorities of the fishing vessel, as well as the Commission, of the master's refusal and any explanation.

28. The authorities of the fishing vessel, unless generally accepted international regulations, procedures and practices relating to safety at sea make it necessary to delay the boarding and inspection, shall direct the master to accept the boarding and inspection. If the master does not comply with such direction, the Member shall suspend the vessel's authorization to fish and order the vessel to return immediately to port. The Member shall immediately notify the authorities of the inspection vessel and the Commission of the action it has taken in these circumstances.

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Use of Force

29. The use of force shall be prohibited except when and to the degree necessary to ensure the safety of the inspectors during the conduct of their boarding and inspection activities. The degree of force used shall not exceed that reasonably required in the circumstances.
30. Any incident involving the use of force shall be immediately reported to the authorities of the fishing vessel, as well as to the Executive Secretary for distribution to the Commission.

Inspection Reports

31. Authorized inspectors shall prepare a full report on each boarding and inspection they carry out pursuant to these procedures in accordance with a format specified by the Commission. The authorities of the inspection vessel from which the boarding and inspection was carried out shall transmit a copy of the boarding and inspection report to the authorities of the fishing vessel being inspected, as well as the Secretariat, within 3 (three) full working days of the completion of the boarding and inspection. Where it is not possible for the authorities of the inspection vessel to provide such report to the authorities of the fishing vessel within this timeframe, the authorities of the inspection vessel shall inform the authorities of the fishing vessel and shall specify the time period within which the report will be provided.
32. Such report shall include the names and authority of the inspectors and clearly identify any observed activity or condition that the authorized inspectors believe to be a violation of the Convention or conservation and management measures in force and indicate the nature of specific factual evidence of such violation.

Serious Violations

33. In the case of any boarding and inspection of a fishing vessel during which the authorized inspectors observe an activity or condition that would constitute a serious violation, as defined in paragraph 38, the authorities of the inspection vessels shall immediately notify the authorities of the fishing vessel, directly as well as through the Commission.
34. Upon receipt of a notification under paragraph 33, the authorities of the fishing vessels shall without delay:

Annex E: CMM 2023-09 HSBI

- a) assume their obligation to investigate and, if the evidence warrants, take enforcement action against the fishing vessel in question and so notify the authorities of the inspection vessel, as well as the Commission; or
 - b) authorize the authorities of the inspection vessel to complete investigation of the possible violation and so notify the Commission.
35. In the case of 34(a) above, the authorities of the inspection vessel shall provide, as soon as practicable, the specific evidence collected by the authorized inspectors to the authorities of the fishing vessel.
36. In the case of 34(b) above, the authorities of the inspection vessel shall provide the specific evidence collected by the authorized inspectors, along with the results of their investigation, to the authorities of the fishing vessel immediately upon completion of the investigation.
37. Upon receipt of a notification pursuant to paragraph 33, the authorities of the fishing vessel shall make best effort to respond without delay and in any case no later than within 3 (three) full working days.
38. For the purposes of these procedures, a serious violation means the following violations of the provisions of the Convention or conservation and management measures adopted by the Commission:
- a) fishing without a valid license, permit or authorization issued by the Member whose flag the fishing vessel is entitled to fly, in accordance with Article 13 of the Convention;
 - b) significant failure to maintain records of catch and catch-related data in accordance with the Commission's reporting requirements or significant misreporting of such catch and/or catch-related data;
 - c) fishing in a closed area;
 - d) fishing during a closed season;
 - e) intentional taking or retention of species in contravention of any applicable conservation and management measure adopted by the Commission;
 - f) significant violation of catch limits or quotas in force pursuant to the Convention;
 - g) using prohibited fishing gear;
 - h) falsifying or intentionally concealing the markings, identity or registration of a fishing vessel;

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- i) concealing, tampering with or disposing of evidence relating to investigation of a violation;
- j) multiple violations which taken together constitute a serious disregard of measures in force pursuant to the Commission;
- k) refusal to accept a boarding and inspection, other than as provided in paragraphs 27 and 28;
- l) assault, resist, intimidate, sexually harass, interfere with, or unduly obstruct or delay an authorized inspector; and
- m) intentionally tampering with or disabling the vessel monitoring system;
- n) such other violations as may be determined by the Commission, once these are included and circulated in a revised version of these procedures.

Enforcement

- 39. Any evidence obtained as a result of a boarding and inspection pursuant to these procedures with respect to violation by a fishing vessel of the Convention or conservation and management measures adopted by the Commission and in force shall be referred to the authorities of the fishing vessel for action in accordance with Article 17 of the Convention.
- 40. For the purposes of these procedures, the authorities of the fishing vessels shall regard interference by their fishing vessels, captains or crew with an authorized inspector or an authorized inspection vessel in the same manner as any such interference occurring within its exclusive jurisdiction.

Annual Reports

- 41. Contracting Parties that authorize inspection vessels to operate under these procedures shall report annually to the Commission on the boarding and inspections carried out by its authorized inspection vessels, as well as upon possible violations observed.
- 42. Contracting Parties shall include in their annual statement of compliance within their Annual Report to the Commission under Article 16 of the Convention action that they have taken in response to boarding and inspections of their fishing vessels that resulted in observation of alleged violations, including any proceedings instituted and sanctions applied.

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Other Provisions

43. Authorized inspection vessels, while carrying out activities to implement these procedures, shall engage in surveillance aimed at identifying fishing vessels of non-Members undertaking fishing activities on the high seas in the Convention area. Any such vessels identified shall be immediately reported to the Executive Secretary for distribution to the Commission.
44. The authorized inspection vessel shall attempt to inform any fishing vessel identified pursuant to paragraph 43 that has been sighted or identified as engaging in fishing activities that are undermining the effectiveness of Convention and that this information will be sent to the Executive Secretary for distribution to the Members of the Commission and the non-Member whose flag the fishing vessel is entitled to fly of the vessel in question.
45. If warranted, the authorized inspectors may request permission from the fishing vessel and/or the non-Member whose flag the vessel is entitled to fly to board a vessel identified pursuant to paragraph 43. If the vessel master or the vessel's non-Member whose flag the vessel is entitled to fly consents to a boarding, the findings of any subsequent inspection shall be transmitted to the Executive Secretary. The Executive Secretary shall distribute this information to all Commission Members as well as to the non-Member whose flag the vessel is entitled to fly.
46. Contracting Parties shall be liable for damage or loss attributable to their action in implementing these procedures when such action is unlawful or exceeds that reasonably required in the light of available information.

Commission Coordination and Oversight

47. Authorized inspection vessels in the same operational area should seek to establish regular contact for the purpose of sharing information on areas in which they are patrolling, on sightings and on boarding and inspections they have carried out, as well as other operational information relevant to carrying out their responsibilities under these procedures.
48. The Commission shall keep under continuous review the implementation and operation of these procedures, including review of annual reports relating to these procedures provided by Members. In applying these procedures, Contracting Parties may seek to promote optimum use of the authorized inspection vessels and authorized inspectors by:

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- a) identifying priorities by area and/or by fishery for boarding and inspections pursuant to these procedures;
- b) ensuring that boarding and inspection on the high seas is fully integrated with the other monitoring, compliance and surveillance tools available pursuant to the Convention;
- c) ensuring non-discriminatory distribution of boarding and inspections on the high seas among fishing vessels of Members of the Commission without compromising the opportunity of Contracting Parties to investigate possible serious violations; and
- d) taking into account high seas enforcement resources assigned by Members of the Commission to monitor and ensure compliance by their own fishing vessels, particularly for small boat fisheries whose operations extend onto the high seas in areas adjacent to waters under their jurisdiction.

Settlement of Disagreements

- 49. In the event of a disagreement concerning the application or implementation of these procedures, the parties concerned shall consult in an attempt to resolve the disagreement.
- 50. If the disagreement remains unresolved following the consultations, the Executive Secretary of the Commission shall, at the request of the parties concerned, and with the consent of the Commission, refer the disagreement to the Technical and Compliance Committee (TCC). The TCC shall establish a panel of five representatives, acceptable to the parties to the disagreement, to consider the matter.
- 51. A report on the disagreement shall be drawn up by the panel and forwarded through the TCC Chair to the Executive Secretary for distribution to the Commission within two months of the TCC meeting at which the case is reviewed.
- 52. Upon receipt of such report, the Commission may provide appropriate advice with respect to any such disagreement for the consideration of the Members concerned.
- 53. Application of these provisions for the settlement of disagreements shall be non-binding. These provisions shall not prejudice the rights of any Member to use the dispute settlement procedures provided in the Convention.

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Annex A

Boarding Ladder Guidelines

Commencing on March 1st, 2022, the Master of a fishing vessel with fishing vessel with a registered tonnage greater than or equal to 250 GT (Gross Tonnage) or GRT (Gross Register Tonnage), as registered in the NPFC Vessel Registry, is encouraged to provide a board ladder that meets the following guidelines:

- a) A boarding ladder shall be provided for the purpose of enabling Authorized Inspectors to safely embark and disembark at-sea pursuant to the provisions of CMM 2023-09.
- b) The ladder shall be secured in an area that is clear of any possible discharges, lines, or obstructions from the vessel.
- c) The ladder shall be placed as near to the mid-length of the vessel as practicable.
- d) Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder and vice versa.
- e) The rigging of the ladder and the embarkation and disembarkation of an Authorized Inspector shall be overseen by a responsible crew member of the vessel, who shall have communication with the bridge.
- f) The steps of the ladder shall be:
 - i) made of hardwood (or of a suitable equivalent material).
 - ii) free from sharp edges or splinters.
 - iii) provided with an effective non-slip surface.
 - iv) not less than 480 mm long, 115 mm wide and 25 mm in depth.
 - v) equally spaced apart to ensure safe and ergonomic climbing of the ladder by an Authorized Inspector.
 - vi) secured in such a manner that they will remain horizontal.
- g) The side ropes of the ladder shall:
 - i) consist of two uncovered manila ropes not less than 65 mm in circumference on each side.
 - ii) shall be continuous with no joins.
 - iii) shall have ends secured to prevent unravelling.
 - iv) Battens (span boards) made of hardwood or a material of equivalent properties, in one piece, shall be provided to prevent the boarding ladder from twisting.
 - v) An authorized inspector shall have the discretion to instruct a vessel master to move or reconfigure the boarding ladder if deemed unsafe for use.

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Note: A graphic regarding the boarding ladder is attached hereto.

CMM 2023-01

(Entered into force dd mm 2023)

**CONSERVATION AND MANAGEMENT MEASURE ON INFORMATION
REQUIREMENTS FOR VESSEL REGISTRATION**

The North Pacific Fisheries Commission (NPFC),

Recalling Article 4 of the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas of 24 November 1993 that stipulates to maintain a record of fishing vessels entitled to fly its flag and authorized to be used for fishing on the high seas, and to take such measures as may be necessary to ensure that all such fishing vessels are entered in that record,

Recognizing Article 7, paragraph 2 (d) of the Convention regarding the establishment of appropriate cooperative mechanisms for effective monitoring, control and surveillance to ensure enforcement of the conservation and management measures adopted by the Commission including mechanisms to prevent, deter and eliminate IUU fishing,

Reaffirming that Article 13, paragraph 1 of the Convention that members of the Commission or Cooperating non-Contracting Parties shall take necessary measures to ensure that fishing vessels entitled to fly its flag operating in the Convention Area comply with the provisions of the Convention and measures adopted pursuant to the Convention and such vessels do not engage in any activities that undermine the effectiveness of such measures and do not conduct unauthorized fishing activities within areas under national jurisdiction of another State adjacent to the Convention Area,

Also reaffirming that Article 13, paragraph 2 of the Convention that no members or Cooperating non-Contracting Parties of the Commission shall allow any fishing vessel entitled to fly its flag to be used for fishing activities in the Convention Area unless it has been authorized to do so by the appropriate authority or authorities of that member of the Commission or Cooperating non-Contracting Parties. Each member of the Commission, or Cooperating non-Contracting Parties, shall authorize the use of vessels entitled to fly its flag in the Convention Area only where it is able to exercise effectively its responsibilities in respect of those vessels under this Convention, the 1982 Convention and the 1995 Agreement,

Annex F: CMM 2023-01 Vessel Registry

Also recognizing that members of the Commission or Cooperating non-Contracting Parties have the need to conduct transshipment with carrier vessels that are flagged to Commission members, Cooperating non-Contracting Parties,

Noting the decision by the IMO Assembly in its 30th session to expand eligibility for IMO numbers to fishing vessels less than 100 gross tons down to a size limit of 12 meters in length overall authorized to operate outside waters under national jurisdiction of the flag State to assist in identifying and tracking fishing vessels and to tackle illegal, unreported and unregulated fishing,

Adopts the following conservation and management measures in accordance with Article 7, Article 13, paragraph 8 and Article 15 of the Convention:

NPFC Vessel Registry

For the purpose of the effective implementation of the Convention, each Commission member or Cooperating non-Contracting Party shall:

1. Maintain a record of fishing vessels entitled to fly its flag and authorized to be used for fishing activities in the Convention Area in accordance with the information requirements in the Annex.
2. Update pertinent information required from paragraph 1 in the NPFC Vessel Registry established under Article 13, paragraph 10 of the Convention, noting that vessel submissions which do not include the initial data elements as indicated in the Annex will not be accepted by the database.
3. Promptly update the NPFC Vessel Registry with:
 - a) any additions to the record; e.g. new vessel authorizations;
 - b) any modifications to this information with dates of such modifications; and
 - c) any deletions from the record, specifying which of the following reasons is applicable:
 - i) the voluntary relinquishment of the fishing authorization by the fishing vessel owner or operator;
 - ii) the withdrawal or non-renewal of the fishing authorization issued in respect of the fishing vessel under Article 13, paragraph 2 of the Convention;
 - iii) the fact that the fishing vessel concerned is no longer entitled to fly its flag;
 - iv) the scrapping, decommissioning, or loss of the fishing vessel concerned; or

Annex F: CMM 2023-01 Vessel Registry

- v) any other grounds, with a specific explanation provided.
- 4. Provide to the Commission, as part of the annual report required pursuant to Article 16 of the Convention, the names of the fishing vessels entered in the record that conducted fishing activities during the previous calendar year.

Vessel Marking

- 5. Each Commission Member and Cooperating non Contracting Party shall ensure that every fishing vessel authorized to fly its flag bear markings that are readily identified in accordance with the FAO Standard Specifications for the Marking and Identification of Fishing Vessels, and recognize that non-compliance with these standards shall be considered a serious violation according to Article 17, paragraph 5 of the NPFC Convention and Article 21 Paragraph 11(f) of the United Nations Fish Stocks Agreement.

General

- 6. Commission Members and Cooperating non-Contracting Parties shall ensure they have maintained the NPFC Vessel Registry of the vessels based on the information provided to it and make the record publicly available as appropriate and subject to any legal confidentiality regulations of the individual Commission member and Cooperating non-Contracting Party.
- 7. The Commission member or Cooperating non-Contracting Parties entering vessels identified in paragraph 2 on the NPFC Vessel Registry established under paragraph 1 shall attest that the vessel or vessels being added recommended are not vessels:
 - a) with a history of illegal, unreported or unregulated (IUU) fishing, unless the ownership of the vessel has subsequently changed and the new owner has provided sufficient evidence demonstrating that the previous owner or operator has no legal, beneficial or financial interest in, or control of the vessels, or Commission members or Cooperating non-Contracting Parties concerned is satisfied that, having taken into account all relevant facts, the vessel is no longer engaged in or associated with IUU fishing; or
 - b) that are currently listed on any of the IUU vessel lists adopted by regional fishery management organizations (RFMOs)
- 8. If a fishing vessel with such an IUU history or on an RFMO IUU Vessel list as noted in paragraph 7 without the appropriate justification noted therein, is uploaded to, or found on the NPFC Vessel

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Registry, the Executive Secretary shall remove the vessel from the appropriate vessel registry with notification of such action to the flag member.

9. Each Commission Member and Cooperating non-Contracting Party entering vessels on the NPFC Vessel Registry must enter the required data for its vessels, immediately after it has so authorized the vessel to conduct fishing activities.
10. An authorized vessel cannot conduct fishing activities in the Convention Area until the vessel has been accepted in the NPFC Vessel Registry.
11. The Commission shall also provide to any Commission Member or Cooperating non-Contracting Party, upon request, information about any vessel entered on the Commission record that is not otherwise publicly available, as appropriate.
12. This CMM shall replace the NPFC CMM 2021-01.

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Annex 1

List of Fields in the NPFC Vessel Registry and their Format and Content

“Asterisks (*) denote ‘initial data elements’ required to commence fishing activities in the Convention Area.”

	Field	Field Name	Field Format	Field Description/ Instructions	Example	Ref.
		NPFC ID	Number (integer)	This number is assigned automatically upon entry of vessel information.	1099	
*	(a)	Flag State	Text	The registered flag state – in UPPER CASE.	CANADA	
*	(b)	Authorizing Member	Text	Country/Member name – in UPPER CASE.	CHINA	
*	(c)	Name of fishing vessel	Text	Name of the fishing vessel as indicated on flag State registration – in UPPER CASE.	HAPPY NO. 123	CMM 2019-01
(where applicable)	(d)	Previous name(s) of fishing vessel	Text	List of the previous name(s) of the fishing vessel in UPPER CASE. <ul style="list-style-type: none"> If the Member/CNCP knows the vessel has no previous names, use “N/A”. 	UNHAPPY NO. 1; IMHERE NO. 2	CMM 2019-01

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				<ul style="list-style-type: none"> If the Member/CNCP does not know if the vessel has any previous names, use “NONE KNOWN”. <p>If multiple previous vessel names, separate entries with “;” (semi-colon).</p>		
*	(e)	Registration number	Text	Alphanumeric registration identifier assigned by the flag country/Member, as indicated on flag country/Member registration – in UPPER CASE.	ABCD1234	CMM 2019-01
(where applicable)	(f)	Previous registration number(s)	Text	Alphanumeric registration identifier assigned by the flag country, as indicated on flag State registration – in UPPER CASE. If multiple previous registration numbers, separate entries with “;” (semi-colon).	EFGH5678; IJKL0109	CMM 2019-01
	(g)	Port of registry	Text	Country/Member name – in UPPER CASE.	PANAMA	CMM 2019-01
(where applicable)	(h)	Previous port(s) of registry	Text	Country/Member name – in UPPER CASE, If multiple previous ports of registry,	CANADA ; JAPAN	CMM 2019-01

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				separate entities with “;” (semi-colon).		
*	(i)	IMO number* *Required for vessels which are eligible to receive IMO numbers	Number (integer)	A seven-digit number assigned to all vessels by HIS. All fishing vessels are required to have an IMO number.	1234567	CMM 2019-01
*	(j)-1	Name of owner(s)	Text	All in UPPER CASE. If multiple owners, separate entries with “;”. If company, enter full name of the company. If personal name, enter last/family name, first/given name(s) (separated by a comma).	DOE, JANE; GOOD CATCH INC.;	CMM 2019-01
*	(j)-2	Address of owner(s)	Text	All in UPPER CASE. Separate components of each address with a comma. If more than one address, separate addresses with “;” (semi-colon).	2F, HAKUYO HALL, TOKYO UNIVERSITY OF MARINE AND TECHNOLOGY, 4-5-7 KONAN, MINATO-KU TOKYO 108-8477 JAPAN.	CMM 2019-01

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*	(k)-1	Name of master	Text	All in UPPER CASE. Enter last/family name, first/given name(s).	DOE, JANE	CMM 2019-01
*	(k)-2	Citizenship of master	Text	All in UPPER CASE. If multiple masters, separate entries with “;” (semi-colon).	RUSSIA	CMM 2019-01
(if any)	(l)	Previous flag	Text	List previous flag(s) of the vessel, if any. • If vessel has no previous flag, enter “N/A”. If multiple previous flags, separate entries with “;” (semi-colon).	JAPAN; REPUBLIC OF KOREA	CMM 2019-01
* (where applicable)	(m)	International Radio Call Sign (IRCS)	Text	Alphanumeric code. All in CAPS without space.	BZ1VK	CMM 2019-01
(where applicable)	(n)	Maritime Mobile Service Identity (MMSI)	Number (integer)	A nine-digit number.	12345678 9	CMM 2019-01
	(o)	Vessel communication types and numbers, including when available: satellite-based telephony or data services/devices.	Number	Enter description of each of any communication devices on board the vessel that use Inmarsat A, B, or C, or that have a satellite telephone number.	C:123344 556	CMM 2019-01

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				If no such communication devices are on board, enter "NONE".		
*	(p)	Vessel Photo Full length color photograph(s) showing Side view including IRCS. Photographs must show clear and unobstructed views that demonstrate compliance with vessel marking requirements to be accepted by the Secretariat for addition to the database; Provision of additional photographs showing bow and stern view are encouraged	PNG JPEG	Upload file containing vessel photo. Enter the name of the electronic data file, using the following format: [NPFC ID #]_[Vessel Name]_[Date of Photograph: dd.mm.yyyy]	1551_JOY NO. 345_06.12 .2019	CMM 2019-01
*	(q)-1	Where (country/Member) built.	Text	Country/Member name – in UPPER CASE.	JAPAN	CMM 2019-01
*	(q)-2	When built (year).	Number (integer)	Enter the year the vessel was built in.	1996	CMM 2019-01
*	(r)	Type of vessel, as specified in	Text		JIGGER VESSELS	CMM 2019-01

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		standard abbreviations under the current <i>FAO International Standard Statistical Classification of Fishery Vessels by Vessel Types</i> (ISSCFV).		Enter vessel type(s) as listed under the FAO ISSCFV.		
	(s)	Normal crew complement	Number (integer)	The number of crew members normally on board the vessel, including officers.	35	CMM 2019-01
	(t)	Type of gear Type of fishing method or methods, as specified in standard abbreviations under the current <i>FAO International Standard Statistical Classification of Fishing Gear</i> (ISSCFG) and additions as requested by Members to accommodate gear not in the ISSCFG.	Text	Enter gear type(s) as listed under the FAO ISSCFG.	LIFT NETS (NEI)	CMM 2019-01

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*	(u)-1	Type of length [Length*, including type of length* and unit of measurement.*]	Text	Enter length overall (LOA), length between perpendiculars, waterline length, or registered length.	Length overall (LOA)	CMM 2019-01
*	(u)-2	Length	Number (decimal)		109.00	CMM 2019-01
*	(u)-3	Length measurement unit	Text	Enter metres or feet.	Metres	CMM 2019-01
	(v)-1	Type of Depth [Depth, including type of depth and unit of measurement.]	Text	Enter draft/draught or moulded depth.	Draft/drau ght Moulded depth	CMM 2019-01
	(v)-2	Depth	Number (decimal)		10.50	
	(v)-3	Depth measurement unit	Text	Enter metres or feet.	Metres	CMM 2019-01
*	(w)- 1	Type of beam [Beam*, including type of beam* and unit of measurement.*]	Text	Enter moulded breadth or extreme breadth.	Moulded breath.	CMM 2019-01
*	(w)- 2	Beam	Number (decimal)		18.00	CMM 2019-01
*	(w)- 3	Beam measurement unit	Text	Enter metres or feet.	Metres	CMM 2019-01
*	(x)-1	Tonnage	Number (decimal)		5005.00	CMM 2019-01

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		[Gross register tonnage*, or gross tonnage* (specify which)]				
*	(x)-2	Tonnage type	Text	Enter gross register tonnage (GRT) or gross tonnage (GT).	GRT	CMM 2019-01
	(y)-1	Power of main engine or engine(s) [Power of main engine or engines, including unit of measurement.]	Number (decimal)		3000.00	CMM 2019-01
	(y)-2	Engine measurement unit	Text	Enter kilowatts (kW), horsepower (hp), or pferdestärke.	Kilowatts (kW)	CMM 2019-01
*	(z)	Domestic Licence Authorization The nature of authorization to fish granted by the flag state in its domestic licence, such as type or method of fisheries authorized and main target species, and	Text and/or number. For date - DAY/MONTH/YEAR	Enter start and end dates of domestic licence authorization, target species, and authorization number.	12-05-2019 – 11-10-2020 Pacific Saury 1135	CMM 2019-01

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		authorized periods.				
*	(z)-1	<p>NPFC Commission Authorization period – the dates for the authorization to operate in the NPFC Convention Area by the Member commencing on the date of notification of the authorization to extend to the date of the domestic authorization period up to a maximum of five years from the notification date.</p> <p>Gear and species will be same as ‘Domestic Licence’, but identified according to the drop down list of individual target species (see example).</p>	For date – DAY/MONTH/YEAR	<p>System automatically enters notification date for commencement of authorization; Member enters end date, e.g., date of licence period if within 5 years from notification date, OR maximum of 5-year period from notification date.</p> <p>The target species for each authorization period must be listed separately</p>	28 November 2020 – 27 November 2025 and species from drop down list – one of: Bottom fish; Mackerel; Japanese flying squid; neon flying squid; Japanese sardine, etc.. (maximum authorization period)	CMM 2019-01
	(aa)	Fish hold capacity, in cubic metres.	Number (decimal)	The total amount of fish capable of being stored on the vessel,	7151.00 m ³	CMM 2019-01

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				excluding bait and fish kept for crew consumption.		
	(bb)	Freezer: number of freezers, type(s), capacity, and unit of measurement. [Freezer type and capacity, including unit of measurement.]	Text; Number (decimal)	Freezer type: enter ice, brine, air blast, air coil, and/or plate freezer. Capacity unit: enter tons/day, metric ton/day, lbs/day, cubic metres, and/or cubic feet.	2-Air blast-55 cubic metres	CMM 2019-01

Specifications for the Marking and Identification of Fishing Vessels

Purpose

1. These specifications are intended to implement the *FAO Standard Specifications for the Marking and Identification of Fishing Vessels* for the North Pacific Fisheries Commission (NPFC).

General Provisions

2. Each Commission Member and Cooperating non-Contracting Party shall ensure that each fishing vessel entitled to fly its flag and authorized to be used for fishing in the Convention Area is:
 - a) marked and identifiable with their International Telecommunication Union Radio Call Sign (IRCS); and
 - b) where an IRCS has not been assigned, the vessel shall be marked and identifiable with the characters allocated by the International Telecommunication Union (ITU) to the flag State and followed by, as appropriate, the licence or registration number assigned by the flag State. In such cases, a hyphen shall be placed between the nationality identification characters, and the licence or registration number identifying the vessel.
3. In order to avoid confusion with the letters I and O, it is recommended that the numbers 1 and 0, which are specifically excluded from the ITU call signs, be avoided by national authorities when allocating licence or registration numbers.
4. Apart from the fishing vessel's name or identification mark and the port of registry as required by international practice or national legislation, the marking system as specified shall, in order to avoid confusion, be the only other vessel identification mark consisting of letters and numbers to be painted on the hull or superstructure.

Application of Markings

5. Each Commission Member and Cooperating non-Contracting Party shall ensure that the markings are prominently displayed at all times:
 - a) on the vessel's side or superstructure, port and starboard; fixtures inclined at an angle to the vessel's side or superstructure are permitted provided that the angle of inclination does not prevent sighting of the sign from another vessel or from the air; and

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- b) on a deck, except as provided for in paragraph 7. Should an awning or other temporary cover be placed so as to obscure the mark on a deck, the awning or cover shall also be marked. These marks should be placed athwartships with the top of the numbers or letters towards the bow.
6. Each Commission Member and Cooperating non-Contracting Party shall ensure that markings are:
- a) placed as high as possible above the waterline on both sides, and that such parts of the hull as the flare of the bow and the stern shall be avoided;
 - b) so placed as to not be obscured by the fishing gear whether it is stowed or in use;
 - c) clear of flow from scuppers or overboard discharges including areas which might be prone to damage or discolouration from the catch of certain types of species; and
 - d) not extended below the waterline.
7. Undecked vessels shall not be required to display the markings on a horizontal surface. However, owners should be encouraged, where practical, to fit a board on which the markings may be clearly seen from the air.
8. Vessels fitted with sails may display the markings on the sail in addition to the hull.
9. Boats, skiffs, and craft carried by the vessel for fishing operations shall bear the same mark as the vessel concerned.

Specifications for Markings

10. Each Commission Member and Cooperating non-Contracting Party shall ensure that:
- a) block lettering and numbering is used throughout;
 - b) the width of the letters and numbers is in proportion to the height;
 - c) the height (*h*) of the letters and the numbers shall be in proportion to the size of the vessel in accordance with the following:
 - i) for marks to be placed on the hull, superstructure, and/or inclined surfaces:

<u>Length of vessel overall (LOA) in metres (m)</u>	Height of letters and numbers in metres (m) is not less than:
25 m and over	1.0 m

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20 m but less than 25 m	0.8 m
15 m but less than 20 m	0.6 m
12 m but less than 15 m	0.4 m
5 m but less than 12 m	0.3 m
Under 5 m	0.1 m

- ii) for marks to be placed on deck: the height shall not be less than 0.3 metres (m) for all classes of vessels of 5 metres (m) and over.
- d) the length of the hyphen shall be half the height of the letters and numbers;
- e) the width of the stroke for all letters, numbers, and the hyphen shall be $h/6$;
- f) the space between letters and/or numbers shall not exceed $h/4$, nor be less than $h/6$; and
- g) the space between adjacent letters having sloping sides shall not exceed $h/8$, nor be less than $h/10$, for example A V.

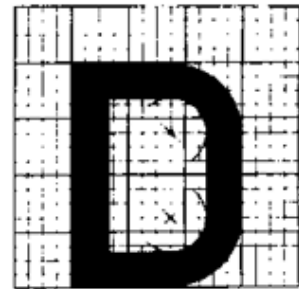
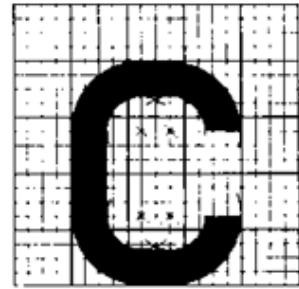
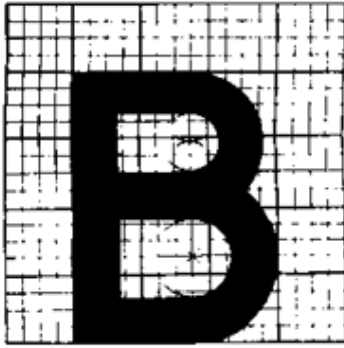
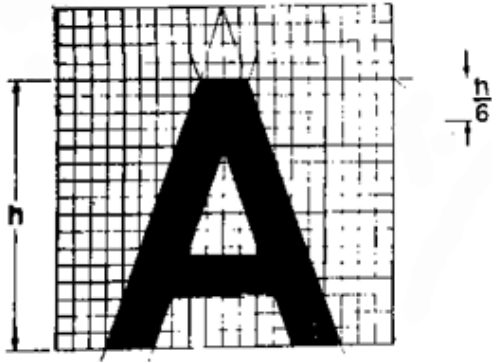
Specifications for Painting of Markings

11. Each Commission Member and Cooperating non-Contracting Party shall ensure that:
- a) the markings are either white on a background, or black on a white background;
 - b) the background shall extend to provide a border around the mark of not less than $h/6$;
 - c) good quality marine paint is used throughout;
 - d) where retro-reflective or heat generating substances are used, the markings meet the requirements of this Annex; and
 - e) the markings and background are maintained in good condition at all times.

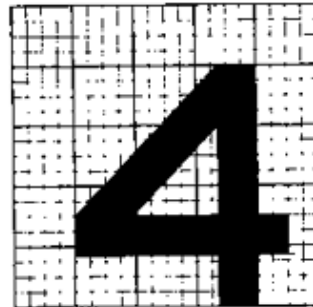
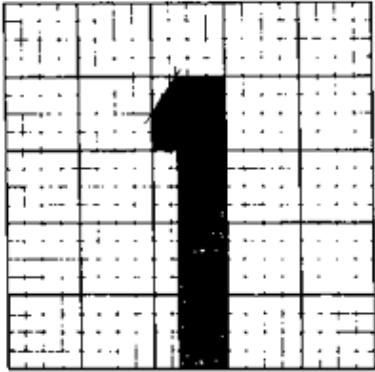
Review and Amendment of Specifications

12. The Commission shall keep these specifications under review, and may amend them as appropriate.

Annex F: CMM 2023-01 Vessel Registry



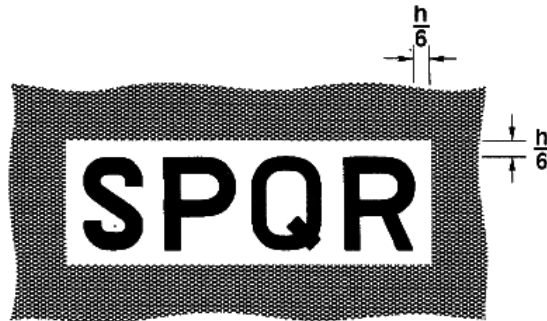
Annex F: CMM 2023-01 Vessel Registry



Annex F: CMM 2023-01 Vessel Registry

Examples of placement of the marks
Exemples d'emplacement des marques
Ejemplos de colocación de las marcas

CONTRAST / CONTRASTE / CONTRASTE



COLOURED BACKGROUND / FOND COLORE / FONDO EN COLOR



Annex F: CMM 2023-01 Vessel Registry

Group No. 1
FACTORY TRAWLER

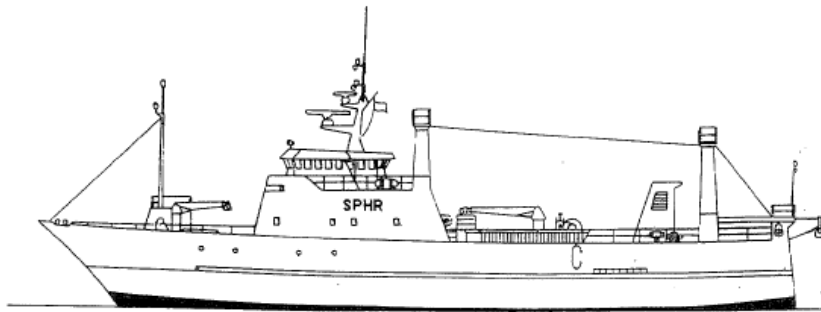
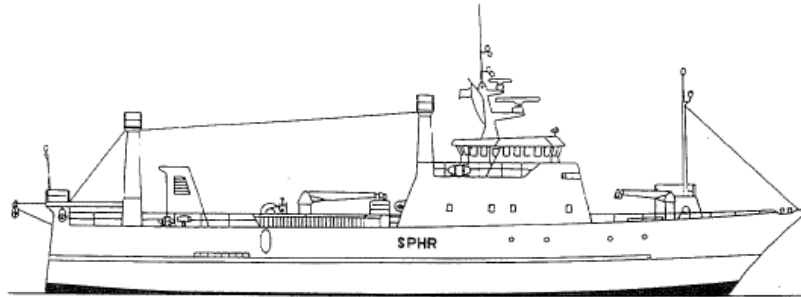
Length over all: 68 m
Call sign: POLAND
Letter height: 1 m

Groupe N° 1
CHALUTIER-USINE

Longueur hors tout: 68 m
Indicatif d'appel: POLOGNE
Hauteur des lettres: 1 m

Grupo N° 1
ARRASTRERO FACTORIA

Eslora máxima: 68 m
Distintivos de llamado: POLONIA
Altura de letra: 1 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 1
TUNA FURSE SEINER

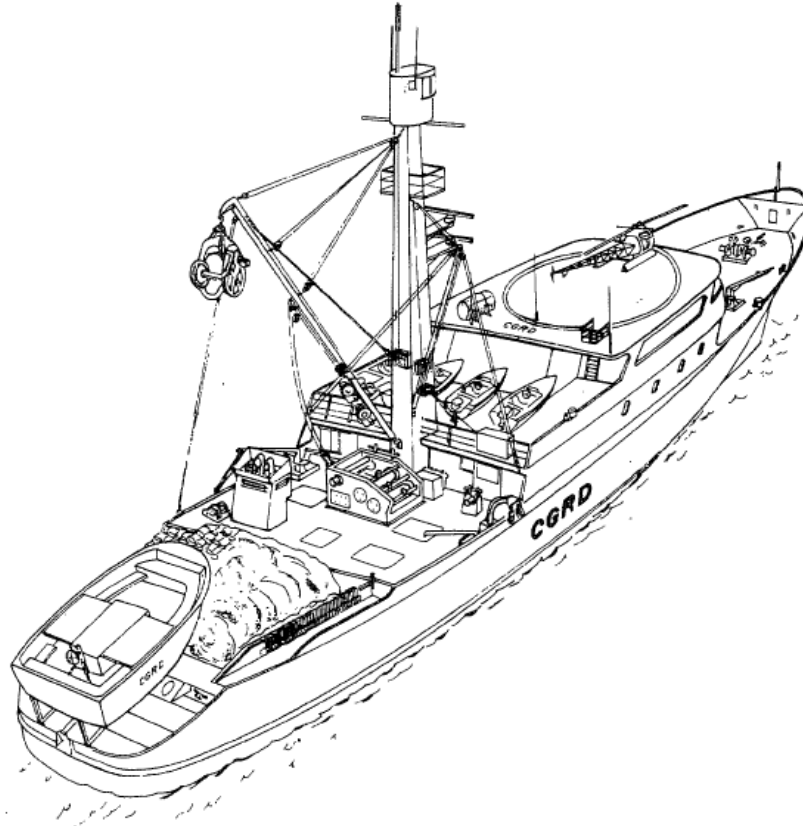
Length over all: 64 m
Call sign: CANADA
Letter height: 1 m
- on superstructure:
0,40 m
- on skiff: 0,40 m

Groupe N° 1
THONIER-SENNEUR

Longueur hors tout: 64 m
Indicatif d'appel: CANADA
Hauteur des lettres: 1 m
- sur les superstructures:
0,40 m
- sur le bateau annexe:
0,40 m

Grupo N° 1
CERQUERO ATUNERO

Eslora máxima: 64 m
Distintivos de llamado: CANADA
Altura de letra: 1 m
- sobre la subestructura:
0,40 m
- sobre la barca auxiliar:
0,40 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 1
POLE AND LINE VESSEL/
AMERICAN TYPE

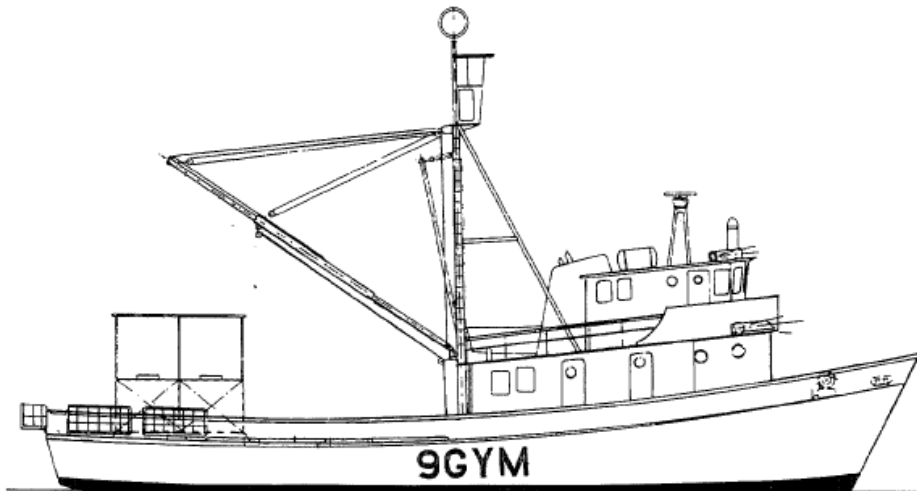
Length over all: 28 m
Call sign: GHANA
Letter height: 1 m

Groupe N° 1
CANNEUR, TYPE AMERICAIN

Longueur hors tout: 28 m
Indicatif d'appel: GHANA
Hauteur des lettres: 1 m

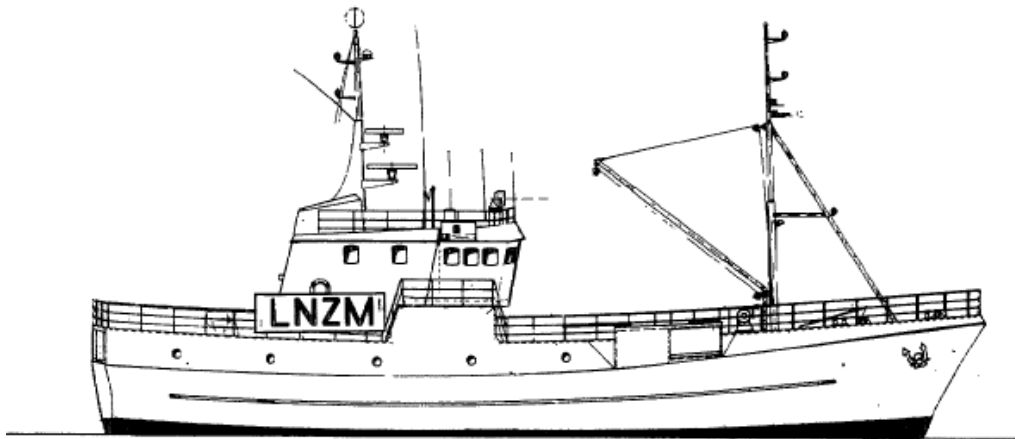
Grupo N° 1
EMBARCACION PARA LA PESCA CON
LINEA Y CAÑA, TIPO AMERICANO

Eslora máxima: 28 m
Distintivos de llamado: GHANA
Altura de letra: 1 m



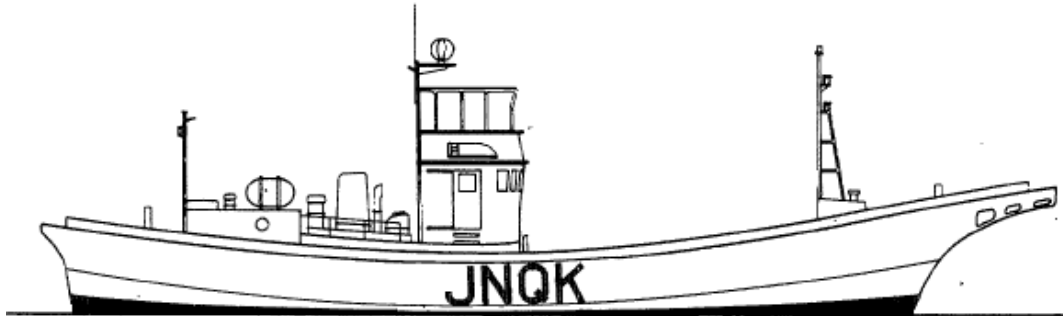
Annex F: CMM 2023-01 Vessel Registry

Group No. 1 LONGLINER	Groupe N° 1 PALANGRIER	Grupo N° 1 PALANGRERO
Length over all: 33.50 m	Longueur hors tout: 33,50 m	Eslora máxima: 33,50 m
Call sign: NORWAY	Indicatif d'appel: NORVEGE	Distintivos de llamado: NORUEGA
Letter height: 1 m	Hauteur des lettres: 1 m	Altura de letra: 1 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 2 POLE AND LINE, JAPANESE TYPE	Groupe N° 2 CANNEUR, TYPE JAPONAISE	Grupo N° 2 EMBARCACION, PARA LA PESCA CON LINEA Y CANA, TIPO JAPONES
Length over all: 21.55 m Call sign: JAPAN Letter height: 0.8 m	Longueur hors tout: 21,55 m Indicatif d'appel: JAPON Hauteur des lettres: 0,8 m	Eslora máxima: 21,55 m Distintivos de llamado: JAPAN Altura de letra: 0,8 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 2
PURSE SEINER

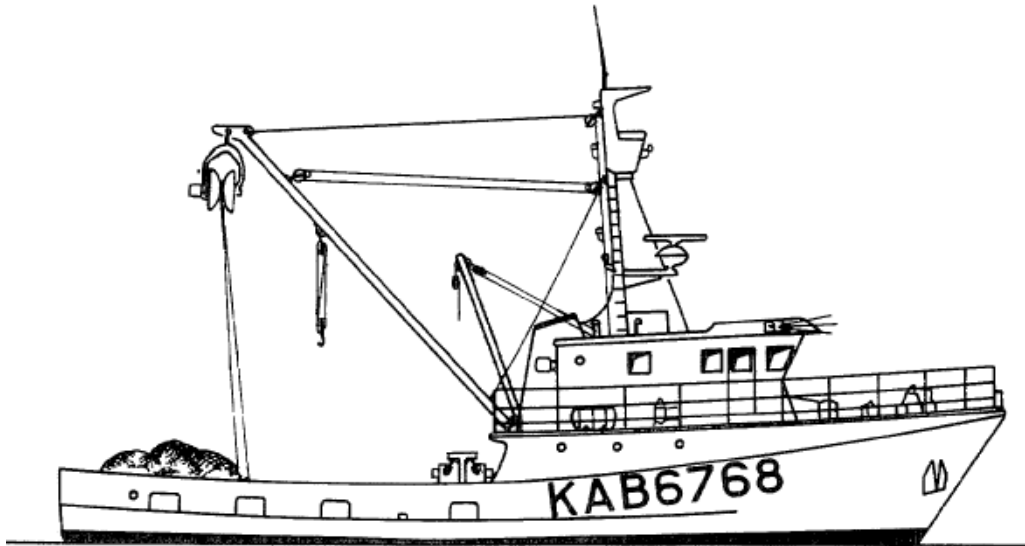
Groupe N° 2
SENNEUR

Grupo N° 2
CERQUERO

Length over all: 22 m
Call sign: U.S.A.
Letter height: 0.8 m

Longueur hors tout: 22 m
Indicatif d'appel: ETATS-UNIS
Hauteur des lettres: 0,8 m

Eslora máxima: 22 m
Distintivos de llamado: ESTADOS
UNIDOS
Altura de letra: 0,8 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 2
SCALLOP DREDGER

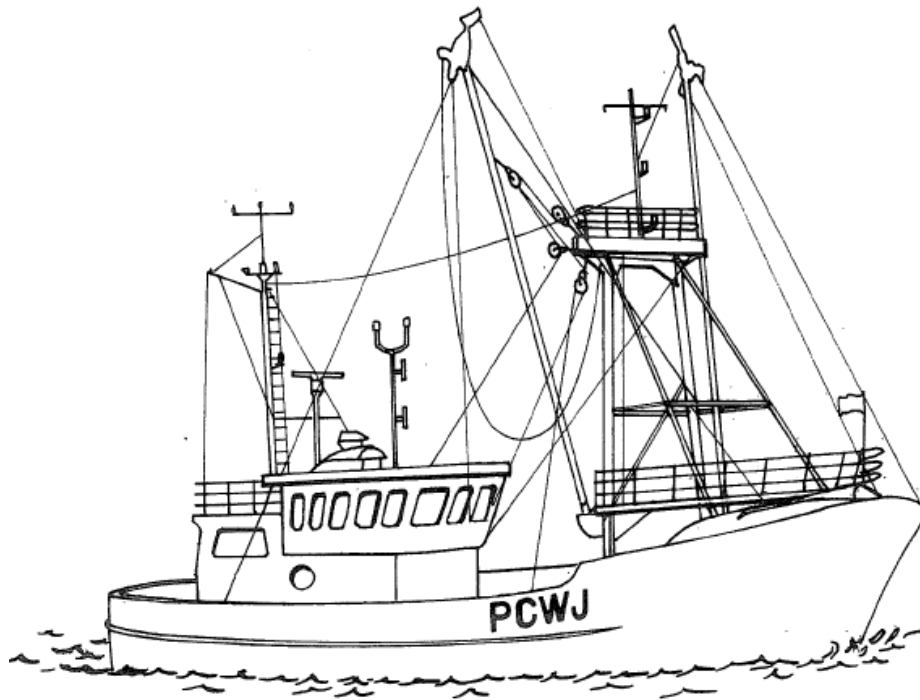
Length over all: 22 m
Call sign: NETHERLANDS
Letter height: 0.8 m

Groupe N° 2
DRAGUEUR

Longueur hors tout: 22 m
Indicatif d'appel: PAYS-BAS
Hauteur des lettres: 0,8 m

Grupo N° 2
RASTRERO

Eslora máxima: 22 m
Distintivos de llamado: PAISES
BAJOS
Altura de letra: 0,8 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 2
TRAWLER/SEINER

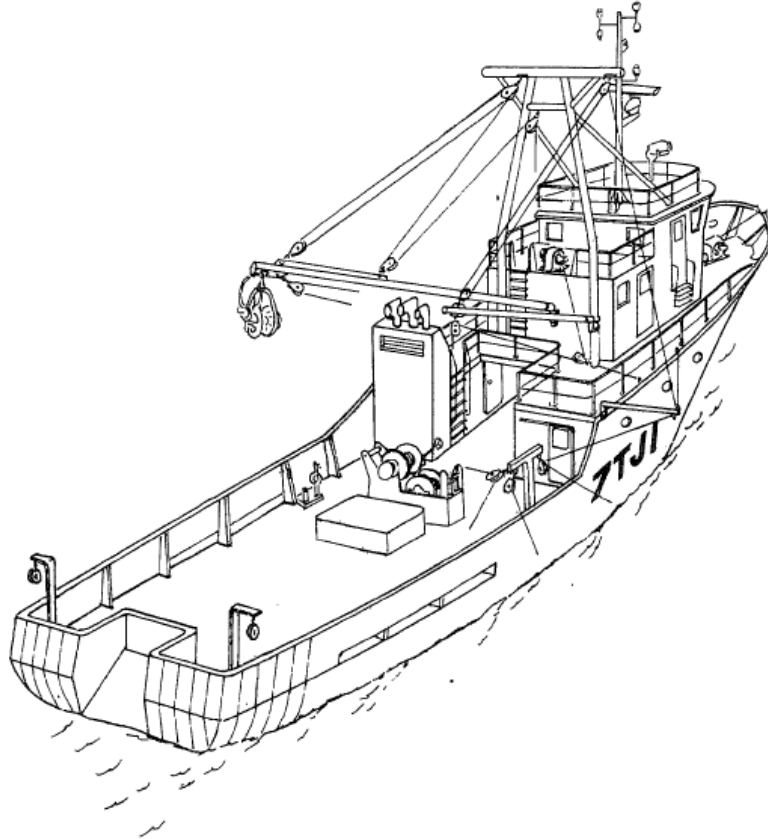
Length over all: 20 m
Call sign: ALGERIA
Letter height: 0.8 m

Groupe N° 2
CHALUTIER-SENNEUR

Longueur hors tout: 20 m
Indicatif d'appel: ALGERIE
Hauteur des lettres: 0,8 m

Grupo N° 2
ARRASTRERO-CERQUERO

Eslora máxima: 20 m
Distintivos de llamado: ARGELIA
Altura de letra: 0,8 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 2
MEDIUM-SIZED SHELTER DECK
STERN TRAWLER

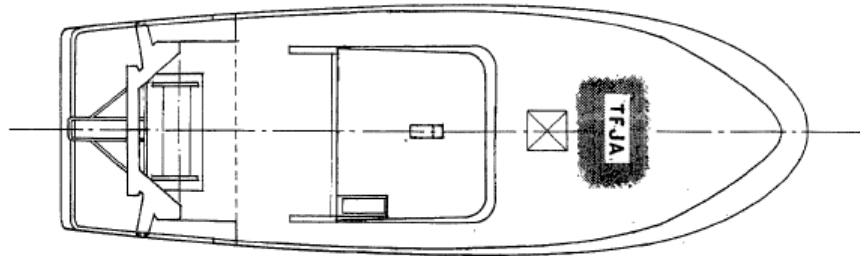
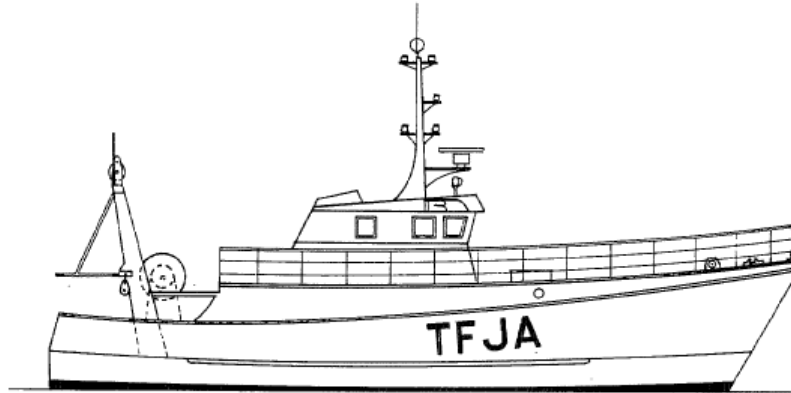
Length over all: 22 m
Call sign: ICELAND
Letter height: 0.8 m
- on deck: 0.3 m

Groupe N° 2
CHALUTIER PECHE ARRIERE DE
TAILLE MOYENNE A PONT COUVERT

Longueur hors tout: 22 m
Indicatif d'appel: ISLANDE
Hauteur des lettres: 0,8 m
- sur le pont: 0,3 m

Grupo N° 2
ARRASTERO POR LA POPA MEDIANO
CON CUBIERTA PROTEGIDA

Eslora máxima: 22 m
Distintivos de llamado:
ISLANDIA
Altura de letra: 0,8 m
- sobre la cubierta: 0,3 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 3
OUTRIGGER TRAWLER

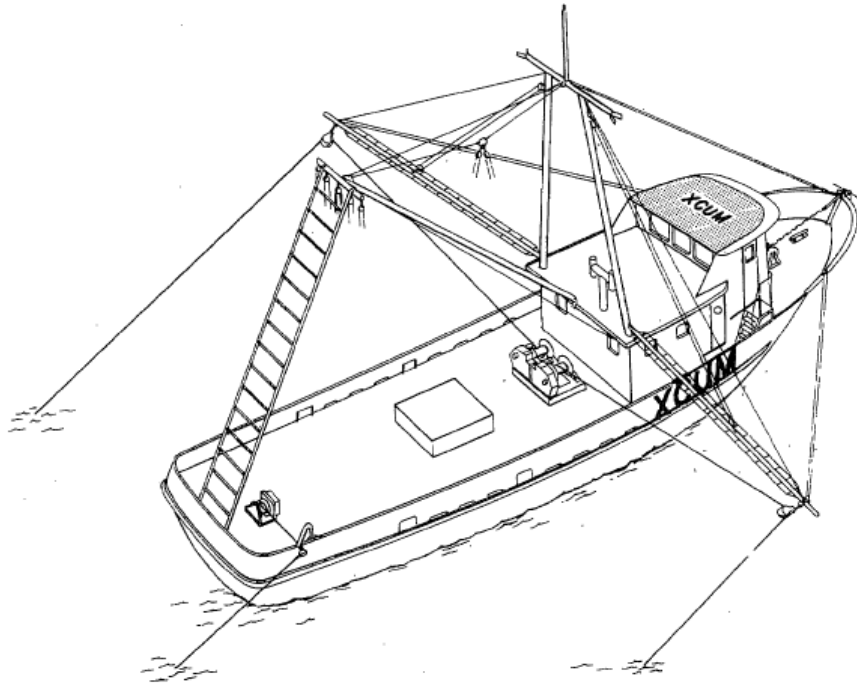
Length over all: 18 m
Call sign: MEXICO
Letter height: 0.6 m
- on wheelhouse top:
0.3 m

Groupe N° 3
CHALUTIER A TANGONS

Longueur hors tout: 18 m
Indicatif d'appel: MEXIQUE
Hauteur des lettres: 0,6 m
- sur le timonerie: 0,3 m

Grupo N° 3
ARRASTRERO CON HORQUETA

Eslora máxima: 18 m
Distintivos de llamado: MEXICO
Altura de letra: 0,6 m
- sobre caseta de gobierno:
0,3 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 3
SEINE NETTER

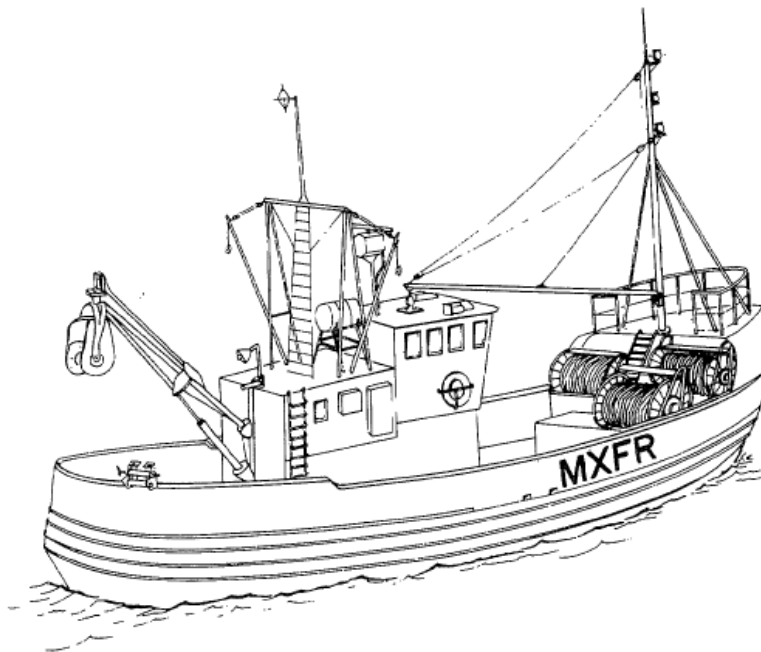
Length over all: 16 m
Call sign: U.K.
Letter height: 0.6 m

Groupe N° 3
SENNEUR A SENNE DE FOND

Longueur hors tout: 16 m
Indicatif d'appel: ROYAUME-
UNI
Hauteur des lettres: 0,6 m

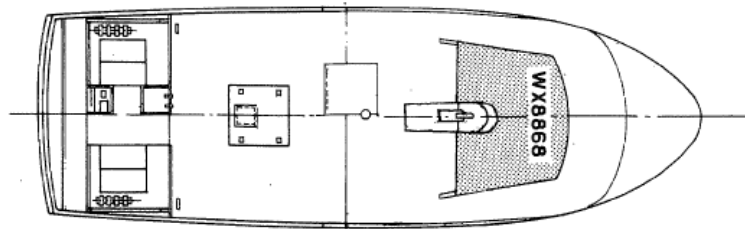
Grupo N° 3
CERQUERO DE RED DE TIRO

Eslora máxima: 16 m
Distintivos de llamado: REINO
UNIDO
Altura de letra: 0,6 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 3 TROLLER	Groupe N° 3 LIGNEUR A LIGNES DE TRAINE	Grupo N° 3 CURRICANERO
Length over all: 16.80 m	Longueur hors tout: 16,80 m	Eslora máxima: 16,80 m
Call sign: U.S.A.	Indicatif d'appel: ETATS-UNIS	Distintivos de llamado: ESTADOS
Letter height: 0.6 m	Hauteur des lettres: 0,6 m	UNIDOS
- on wheelhouse: 0.3 m	- sur le timonerie: 0,3 m	Altura de letra: 0,6 m
		- sobre caseta de gobierno: 0,3 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 4
SMALL LONGLINER

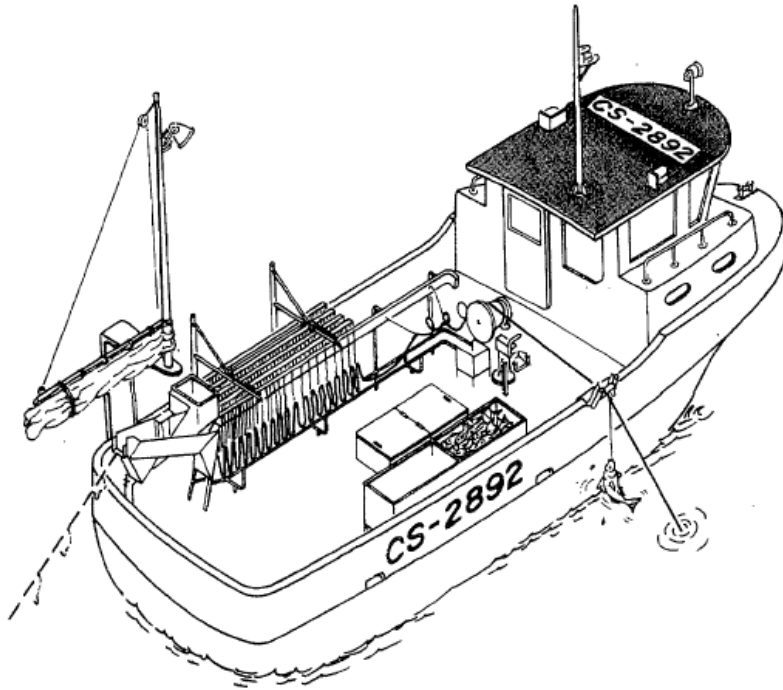
Length over all: 14 m
Call sign: PORTUGAL + No.
Letter height: 0.4 m
- on wheelhouse: 0.3 m

Groupe N° 4
PALANGRIER DE PETITE TAILLE

Longueur hors tout: 14 m
Indicatif d'appel: PORTUGAL
+ N°
Hauteur des lettres: 0,4 m
- sur la timonerie: 0,3 m

Grupo N° 4
PALANGRERO PEQUEÑO

Eslora máxima: 14 m
Distintivos de llamado:
PORTUGAL + N°
Altura de letra: 0,4 m
- sobre la caseta de gobierno:
0,3 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 4
SMALL STERN TRAWLER

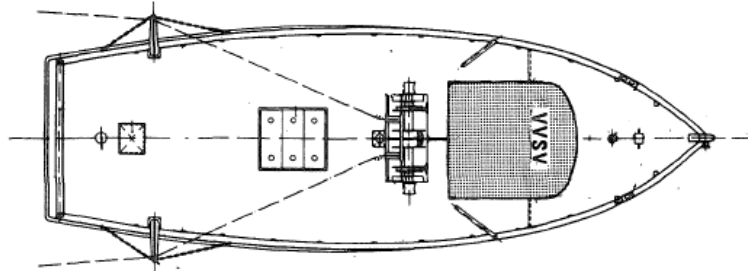
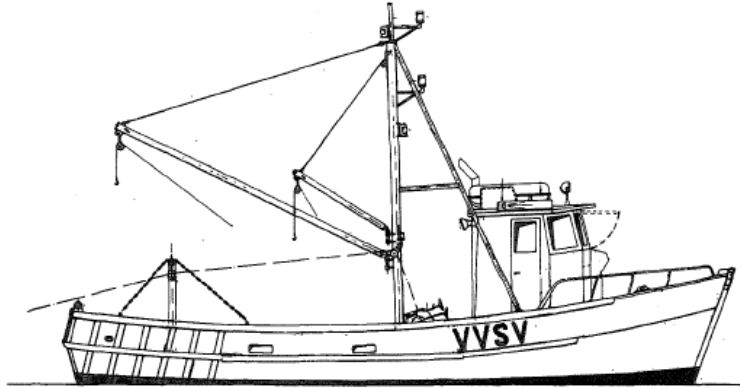
Length over all: 13 m
Call sign: INDIA
Letter height: 0.4 m
- on wheelhouse top:
0.3 m

Groupe N° 4
CHALUTIER PECHE ARRIERE DE
PETITE TAILLE

Longueur hors tout: 13 m
Indicatif d'appel: INDE
Hauteur des lettres: 0,4 m
- sur le timonerie: 0,3 m

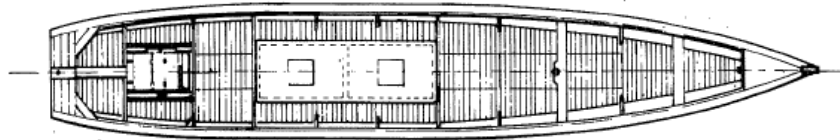
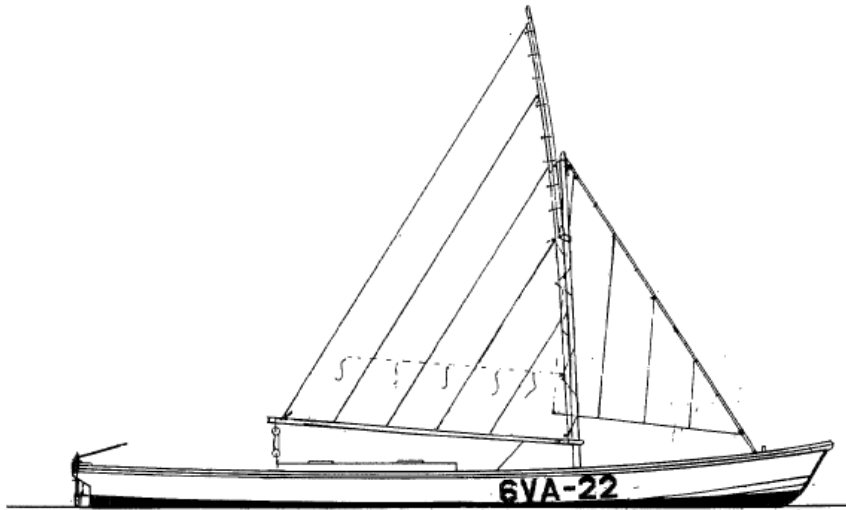
Grupo N° 4
ARRASTRERO POR LA POPA PEQUEÑA

Eslora máxima: 13 m
Distintivos de llamado: INDIA
Altura de letra: 0,4 m
- sobre caseta de gobierno:
0,3 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 4 HANDLINER	Groupe N° 4 LIGNEUR A LIGNES A MAIN	Grupo N° 4 EMBARCACION PARA LA PESCA CON LINEAS DE MANO
Length over all: 14.80 m	Longueur hors tout: 14,80 m	Eslora máxima: 14,80 m
Call sign: SENEGAL + No.	Indicatif d'appel: SENEGAL	Distintivos de llamado: SENEGAL
Letter height: 0.4 m	+ N° Hauteur des lettres: 0,4 m	+ N° Altura de letra: 0,4 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 5
MULTIPURPOSE VESSEL

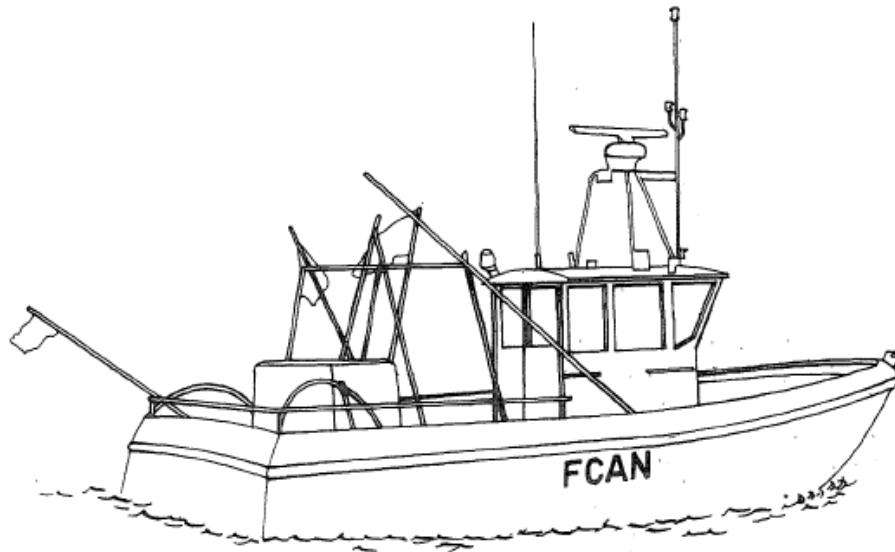
Length over all: 9 m
Call sign: FRANCE
Letter height: 0.30 m

Groupe N° 5
NAVIRE POLYVALENT

Longueur hors tout: 9 m
Indicatif d'appel: FRANCE
Hauteur des lettres: 0,30 m

Grupo N° 5
EMBARCACION POLYVALENT

Eslora máxima: 9 m
Distintivos de llamado: FRANCIA
Altura de letra: 0,30 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 5
VESSEL WITH SAIL

Groupe N° 5
BATEAU AVEC VOILE

Grupo N° 5
BARCO CON VELA

Length over all: 7.4 m
Call sign: BENIN + No.
Letter height: 0.30 m

Longueur hors tout: 7,4 m
Indicatif d'appel: BENIN +
N°
Hauteur des lettres: 0,30 m

Eslora máxima: 7,4 m
Distintivos de llamado: BENIN +
N°
Altura de letra: 0,30 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 5
HANDLINER

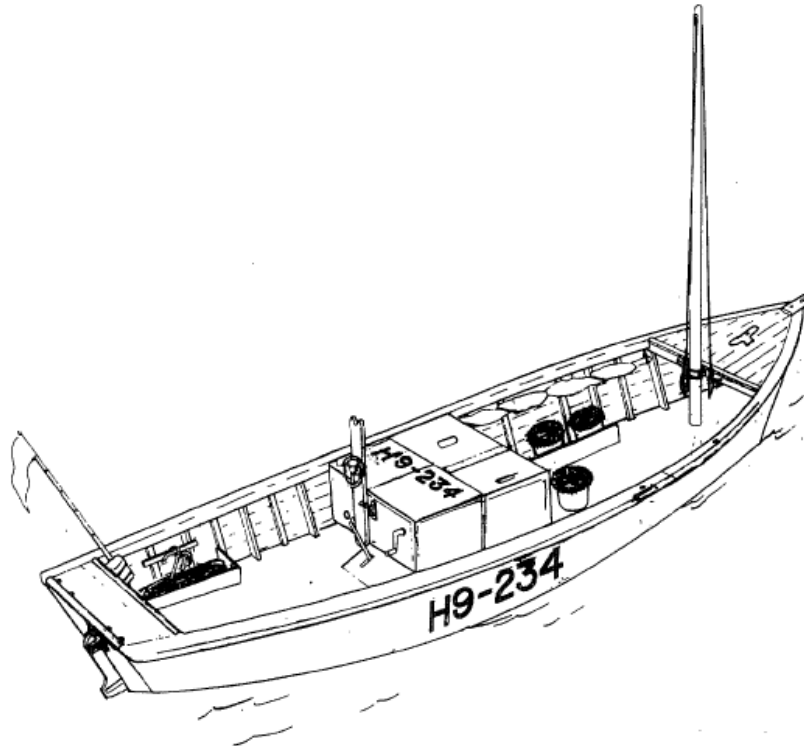
Length over all: 7.60 m
Call sign: PANAMA + No.
Letter height: 0.3 m
- on engine box: 0.10 m

Groupe N° 5
LIGNEUR A LIGNES A MAIN

Longueur hors tout: 7,60 m
Indicatif d'appel: PANAMA +
N°
Hauteur des lettres: 0,3 m
- sur coffe du moteur:
0,10 m

Grupo N° 5
EMBARCACION PARA LA PESCA CON
LINEAS DE MANO

Eslora máxima: 7,60 m
Distintivos de llamado: PANAMA
+ N°
Altura de letra: 0,3 m
- sobre alojamiento del motor:
0,10 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 5
SMALL POT FISHING VESSEL

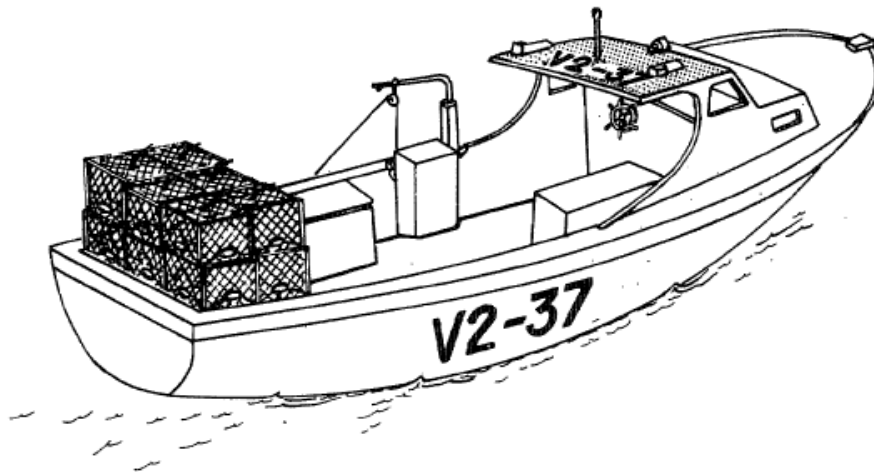
Length over all: 6 m
Call sign: ANTIGUA
Letter height: 0.3 m
- on the cuddy: 0.10 m

Groupe N° 5
CASEYEUR DE PETITE TAILLE

Longueur hors tout: 6 m
Indicatif d'appel: ANTIGUA
Hauteur des lettres: 0,3 m
- sur la tille: 0,10 m

Grupo N° 5
EMBARCACION PARA LA PESCA CON
NASAS PEQUEÑA

Eslora máxima: 6 m
Distintivos de llamado: ANTIGUA
Altura de letra: 0,3 m
- sobre la camarote de proa:
0,10 m



Annex F: CMM 2023-01 Vessel Registry

Group No. 6
OUTBOARD POWERED BOAT

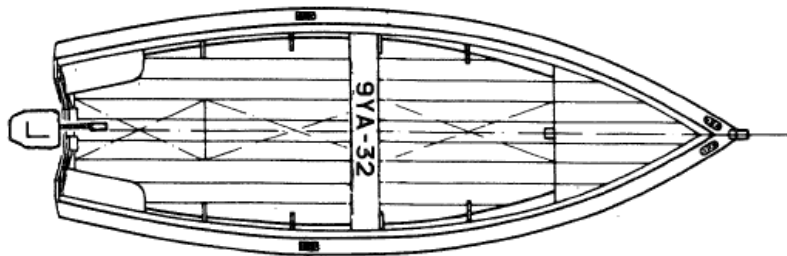
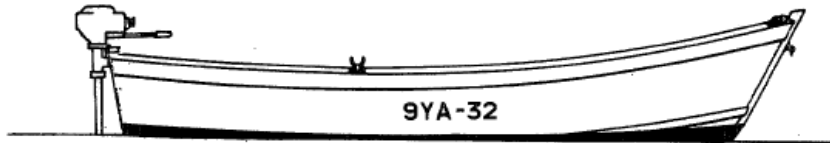
Length over all: 4.80 m
Call sign: TRINIDAD AND
TOBAGO + No.
Letter height: 0.10 m
- on seat: 0.10 m

Groupe N° 6
BATEAU A MOTEUR HORS-BORD

Longueur hors tout: 4,80 m
Indicatif d'appel: TRINITE-
ET-TOBAGO + N°
Hauteur des lettres: 0,10 m
- sur le banc: 0,10 m

Grupo N° 6
LANCHA CON MOTOR FUERA DE BORDA

Eslora máxima: 4,80 m
Distintivos de llamado:
TRINIDAD Y TABAGO + N°
Altura de letra: 0,10 m
- sobre banco: 0,10 m



Annex G: TCC workplan 2023-2024

TCC/SWG WORKPLAN FOR 2023-2024 (Priorities shaded)

No.	ISSUE	LEAD	ACTION / TIMELINE
1.	<p>VMS Implementation:</p> <ul style="list-style-type: none"> • New contract required for August • Training in THEMIS for secretariat staff, and as required, FMC leads • Queries to be established for VMS data analysis • Consideration of revisions to CMM to improve data • Develop and include appropriate provisions in the VMS CMM and its data sharing protocol to ensure the provision of VMS data to Members with aerial inspection presence in alignment with the definition in Article 1 g) 	<ul style="list-style-type: none"> • Secretariat • Secretariat and SWG Ops, if appropriate • Secretariat, working with SWG Ops • Secretariat with SWGs Ops • SWG OPS 	<ul style="list-style-type: none"> • Existing Contract expires August 3, 2023; new contract prepared by June 1. • Training needs identified and scheduled by June 1. • Queries for 2024 VMS review to be finalized by June 30. • SWG, supported by secretariat, review the provisions of CMM and propose enhancements, if appropriate – December 2023. • TCC07

Annex G: TCC workplan 2023-2024

2.	<p>Transshipment</p> <ul style="list-style-type: none"> Possible adoption of transshipment measure (if not adopted, interim measure requires amendment- remove reference to Interim Register in 2 c)) Consideration of mechanism to capture transshipment data in database to facilitate analysis Consideration of complementary measures to support effective transshipment control (e.g. observers /EM, port inspections) Consideration of proposal to explore new monitoring technologies to help quantify extent of transshipments in CA 	<ul style="list-style-type: none"> TCC/SWGs /Secretariat Secretariat SWGs Secretariat/SWG Ops 	<ul style="list-style-type: none"> Secretariat will work with SWGs to identify logistical requirements to support implementation of a transshipment measure, including an automated data entry system to capture reports. September 2023. Secretariat to present costed options to SWG June 15. SWG, with support from secretariat, will explore options for complementary measures to support transshipment. A prioritized list and timelines for draft measures could be developed by June 30. Secretariat to work with SWG Ops to draft a proposal to partner with interested parties to explore potential project(s) (funded through Special Projects Fund) to utilize satellite technology (SAR/RF/Optical Sensors VIIRS). Proposal to be presented at TCC07.
3.	<p>Observer program / EM</p> <ul style="list-style-type: none"> Options to be developed for a transshipment observer programme and/or electronic monitoring scheme 	<ul style="list-style-type: none"> SWGs/Secretariat 	<ul style="list-style-type: none"> Secretariat to research options for implementation of observer program for presentation to SWGs.
4.	<p>Vessel Registry</p> <ul style="list-style-type: none"> Some information gaps identified in registry, as well as issue with "duplicate vessels " 	<ul style="list-style-type: none"> Secretariat- SWG OPS 	<ul style="list-style-type: none"> Secretariat to continue "cleanup "of VR, removing and identifying information "gaps" in Registry- September 30.

Annex G: TCC workplan 2023-2024

			<ul style="list-style-type: none"> • SWG OPS to review identified gaps and recommend cooperation from Members to update the Registry with current details- complete by TCC07.
5.	<p>CMS Consider options to refine and further develop and better implement a robust CMS consistent with discussions at TCC06, to allow the Secretariat undertaking reliable assessment and TCC adopting a robust CMR in 2024 and beyond</p>	<ul style="list-style-type: none"> • SWGs/Secretariat 	<ul style="list-style-type: none"> • Secretariat to refine list of obligations and identify where data gaps exist to prevent compliance assessment.
6.	<p>HSBI</p> <ul style="list-style-type: none"> • [Harmonized interpretation of inspection protocols is required for HSBI operations(depending on outcome of Covid-19 document)] • Boarding ladder issue remains under review • Enhancements to the HSBI Events page are required to facilitate data analysis 	<ul style="list-style-type: none"> • SWG Ops/Secretariat • SWG Ops • Secretariat 	<ul style="list-style-type: none"> • SWG Ops to work toward articulation of a shared understanding of inspection protocols. • SWG Ops to review information on boarding ladder/other safety related issues in context of at sea inspection program (ongoing). • Secretariat to work with service provider to seek options/costs of enhancing the data entry process for HSBI reports to enable direct entry of reports by Members and automated report generation by secretariat. Options presented by 1 May.
7.	<p>Port Inspection program</p> <ul style="list-style-type: none"> • Options to develop minimum standards for port inspection 	<ul style="list-style-type: none"> • SWG PD /OPS Secretariat 	<ul style="list-style-type: none"> • Secretariat work with SWG PD to develop considerations for the future implementation of port inspection measures - complete by TCC07.
8.	<p>CMMs</p>		

Annex G: TCC workplan 2023-2024

	<ul style="list-style-type: none"> Minor editorial and formatting issues within existing CMMs 	<ul style="list-style-type: none"> Secretariat /SWG PD 	<ul style="list-style-type: none"> Secretariat to compile list of proposed edits and present to SWG-PD for consideration – by 15 May.
9.	<p>RFMO and IGO Collaboration and Cooperation</p> <ul style="list-style-type: none"> MOUs with overlapping and adjacent RFMOs Participation in IMCS Network workshops and seminars, PPFCN for informal compliance links and efforts; Workplan for NPAFC MoC 	<ul style="list-style-type: none"> Secretariat/SWGs Secretariat TCC 	<ul style="list-style-type: none"> Secretariat to liaise with colleagues in WCPFC and SPRFMO to prepare for activities under eventual MoU. Secretariat to attend TCC of WCPFC September 2023, and participate in GFETW, Halifax, Canada July- Aug. Secretariat to offer to host face to face meeting of PPFCN on margins of monitoring workshop in Tokyo 2023/2024. TCC to review proposed compliance related activities in workplan drafted under NPFC- NPAFC MoC.
10.	<p>Outstanding Issues from COM</p> <ul style="list-style-type: none"> Share information with Global record Standardization of "serious violations" 	<ul style="list-style-type: none"> Secretariat SWGs/Secretariat 	<ul style="list-style-type: none"> Secretariat will develop a plan for participation in Global record. Secretariat to compile a list of references to serious violations in NPFC Convention and CMMs for review in SWGs. Secretariat to review previous meeting reports and identify any outstanding action items for TCC – to be presented at next SWG meeting.
11.	<p>Performance Review: Consideration of TCC relevant recommendations consistent with direction from Commission</p>	<ul style="list-style-type: none"> Secretariat/SWGs 	<ul style="list-style-type: none"> Secretariat to prepare list of TCC – relevant recommendations for review and prioritization by SWGs.

CMM 2023-09

(Entered into force dd mm2023)

**CONSERVATION AND MANAGEMENT MEASURE FOR
HIGH SEAS BOARDING AND INSPECTION PROCEDURES FOR THE
NORTH PACIFIC FISHERIES COMMISSION**

1. The following procedures are established by the North Pacific Fisheries Commission, in accordance with Article 7, paragraph 2-c of its Convention, to govern high seas boarding and inspection of fishing vessels in the Convention Area.

Definitions

2. For the purposes of interpreting and implementing these procedures, the following definitions shall apply:
 - a) “Convention” means the Convention on the Conservation and Management of High Seas Fisheries resources in the North Pacific Ocean;
 - b) “Commission” means the North Pacific Fisheries Commission (NPFC) established under Article 5 of the Convention;
 - c) “Authorities of the Inspection Vessel” means the authorities of the Contracting Party under whose jurisdiction the inspection vessel is operating;
 - d) “Authorities of the Fishing Vessel” means the authorities of the Member of the Commission under whose jurisdiction the fishing vessel is operating;
 - e) “Authorized inspection vessel” means any vessel included in the Commission’s register of vessels as authorized to engage in boarding and inspection activities pursuant to these procedures;
 - f) “Authorized inspector” means inspectors employed by the authorities responsible for boarding and inspection included in the Commission register and authorized to conduct boarding and inspection activities pursuant to these procedures;
 - g) “Fishing activity” means the activities established under Article 1 (i) of the Convention;
 - h) “Fishing vessels” means any vessel described under Article 1 (j) of the Convention.

Annex K: CMM 2023-09 High Seas Boarding and Inspection Procedures

Purpose

3. Boarding and inspection and related activities conducted pursuant to these procedures shall be for the purpose of ensuring compliance with the provisions of the Convention and conservation and management measures adopted by the Commission and in force.

Area of Application

4. These procedures shall apply throughout the Convention Area, which consists of the high seas areas of the North Pacific Ocean as specified in Article 4 of the Convention.

General Rights and Obligations

5. Each Contracting Party may, subject to the provisions of these procedures, carry out boarding and inspection on the high seas of fishing vessels engaged in or reported to have engaged in a fishery regulated pursuant to the Convention.
6. These procedures shall also apply in their entirety as between a Contracting Party and a Fishing Entity, subject to a notification to that effect to the Commission from the parties concerned.
7. Each Member of the Commission shall ensure that vessels flying its flag accept boarding and inspection by authorized inspectors in accordance with these procedures. Such authorized inspectors shall comply with these procedures in the conduct of any such activities.

General Principles

8. These procedures are intended to implement and give effect to, and are to be read consistently with, Article 7.2.c and Article 17.6 of the Convention.
9. These procedures shall be implemented in a transparent and non-discriminatory manner, taking into account, inter alia:
 - a) such factors as the presence of observers on board a vessel and the frequency and results of past inspections; and

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- b) the full range of measures to monitor compliance with the provisions of the Convention and agreed conservation and management measures, including inspection activities carried out by the authorities of Members of the Commission in respect of their own flag vessels.
 - c) that NPFC Member inspectors are at risk of serious injury during the boarding process and that minimum standards for boarding ladders are to be implemented to the extent possible minimize this risk.
10. While not limiting efforts to ensure compliance by all vessels, priority for boarding and inspection efforts pursuant to these procedures may be given to:
- a) fishing vessels that are not on the NPFC Record of Fishing Vessels and are flagged to Members of the Commission;
 - b) fishing vessels reasonably believed to engage or to have been engaged in any activity in contravention of the Convention or any conservation and management measure adopted thereunder;
 - c) fishing vessels that are entitled to fly the flag of a Member of the Commission that does not dispatch patrol vessels to the area of application to monitor its own fishing vessels;
 - d) fishing vessels without observers on board if so required by the Convention, Article 7.2b;
 - e) fishing vessels with a known history of violating conservation and management measures adopted by international agreement or any domestic laws and regulations.
11. The Commission shall keep the implementation of these procedures under review.
12. The interpretation of these procedures shall rest with the Commission.

Participation

13. The Commission shall maintain a register of all authorized inspection vessels and authorities or inspectors. Only vessels and authorities or inspectors listed on the Commission's register are authorized under these procedures to board and inspect fishing vessels of Commission Members and Cooperating Non-Contracting Parties on the high seas within the Convention Area.
14. Each Contracting Party that intends to carry out boarding and inspection activities pursuant to these procedures shall so notify the Commission, through the Executive Secretary, and shall provide the following:

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- a) with respect to each inspection vessel it assigns to boarding and inspection activities under these procedures:
 - i) details of the vessel (name, description, photograph, registration number, port of registry (and, if different from the port of registry, port marked on the vessel hull), international radio call sign and communication capability);
 - ii) An example of the credentials issued to the inspectors by its authorities;
 - iii) notification that the inspection vessel is clearly marked and identifiable as being on government service;
 - iv) notification that the crew has received and completed training in carrying out boarding and inspection activities at sea in accordance with any standards and procedures as may be adopted by the Commission.
 - b) with respect to inspectors it assigns pursuant to these procedures:
 - i) the names of the authorities responsible for boarding and inspection;
 - ii) notification that such authorities' inspectors are fully familiar with the fishing activities to be inspected and the provisions of the Convention and conservation and management measures in force; and
 - iii) notification that such authorities' inspectors have received and completed training in carrying out boarding and inspection activities at sea in accordance with any standards and procedures as may be adopted by the Commission.
15. Where military vessels are used as a platform for the conduct of boarding and inspection, the authorities of the inspection vessel shall ensure that the boarding and inspection is carried out by inspectors fully trained in fisheries enforcement procedures and duly authorized for this purpose under national laws, and that boardings from such military vessels and inspectors conform to the procedures contained within these Boarding and Inspection Procedures.
16. Authorized inspection vessels and inspectors notified by Contracting Parties pursuant to paragraph 14 shall be included on the Commission register once the Executive Secretary confirms that they meet the requirements of that paragraph.
17. To enhance the effectiveness of the Commission's boarding and inspection procedures, and to maximize the use of trained inspectors, Contracting Parties may identify opportunities to place authorized inspectors on inspection vessels of another Contracting Party. Where appropriate,

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Contracting Parties should seek to conclude bilateral arrangements to this end or otherwise facilitate communication and coordination between them for the purpose of implementing these procedures.

18. The Executive Secretary shall ensure that the register of authorized inspection vessels and authorities or inspectors is at all times available to all Members of the Commission and shall immediately circulate any changes therein. Updated lists shall be posted on the Commission website. Each Member of the Commission shall take necessary measures to ensure that these lists are circulated in a timely manner to each of its fishing vessels operating in the Convention Area.

Procedures

19. The Commission shall develop an NPFC inspection flag, which shall be flown by authorized inspection vessels, in clearly visible fashion.
20. Authorized inspectors shall carry an approved identity card identifying the inspector as authorized to carry out boarding and inspection procedures under the auspices of the Commission and in accordance with these procedures.
21. An authorized inspection vessel that intends to board and inspect a fishing vessel on the high seas that is engaged in or reported to have engaged in a fishery regulated pursuant to the Convention shall, prior to initiating the boarding and inspection:
 - a) make best efforts to establish contact with the fishing vessel by radio, by the appropriate International Code of Signals or by other accepted means of alerting the vessel;
 - b) provide the information to identify itself as an authorized inspection vessel - name, registration number, international radio call sign and contact frequency;
 - c) communicate to the master of the vessel its intention to board and inspect the vessel under the authority of the Commission and pursuant to these procedures; and
 - d) initiate notice through the authorities of the inspection vessel of the boarding and inspection to the authorities of the fishing vessel.
22. In carrying out boarding and inspection pursuant to these procedures, the authorized inspection vessel and authorized inspectors shall make their best efforts to communicate with the master of the fishing vessels in a language that the master can understand. In order to facilitate communications between the inspectors and the master of the vessel, the Commission shall develop a standardized multi-language questionnaire, which shall be circulated to all Contracting Parties with authorized inspection vessels.

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23. Authorized inspectors shall have the authority to inspect the vessel, its license, gear, equipment, records, facilities, fish and fish products and any relevant documents necessary to verify compliance with the conservation and management measures in force pursuant to the Convention.
24. Boarding and inspection pursuant to these procedures shall:
- a) be carried out in accordance with internationally accepted principles of good seamanship so as to avoid risks to the safety of fishing vessels and crews;
 - b) be conducted as much as possible in a manner so as not to interfere unduly with the lawful operation of the fishing vessel;
 - c) take reasonable care to avoid action that would adversely affect the quality of the catch; and
 - d) not be conducted in such manner as to constitute harassment of a fishing vessel, its officers or crew.
25. In the conduct of a boarding and inspection, the authorized inspectors shall:
- a) present their identity card to the master of the vessel and a copy of the text of the relevant measures in force pursuant to the Convention in the relevant area of the high seas;
 - b) not interfere with the master's ability to communicate with the authorities of the fishing vessel;
 - c) complete the inspection of the vessel within 4 (four) hours unless evidence of a serious violation is found;
 - d) collect and clearly document any evidence they believe indicates a violation of measures in force pursuant to the Convention;
 - e) provide to the master prior to leaving the vessel a copy of an interim report on the boarding and inspection including any objection or statement which the master wishes to include in the report;
 - f) promptly leave the vessel following completion of the inspection if they find no evidence of a serious violation; and
 - g) provide a full report on the boarding and inspection to the authorities of the fishing vessel, pursuant to paragraph 31, which shall also include any master's statement.
26. During the conduct of a boarding and inspection, the master of the fishing vessel shall:
- a) follow internationally accepted principles of good seamanship so as to avoid risks to the safety of authorized inspection vessels and inspectors;

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- b) accept and facilitate prompt and safe boarding by the authorized inspectors;
- c) be encouraged to provide a boarding ladder in accordance with Annex A;
- d) cooperate with and assist in the inspection of the vessel pursuant to these procedures;
- e) not assault, resist, intimidate, interfere with, or unduly obstruct or delay the inspectors in the performance of their duties;
- f) allow the inspectors to communicate with the crew of the inspection vessel, the authorities of the inspection vessel, any embarked observers, as well as with the authorities of the fishing vessel being inspected;
- g) provide the inspectors onboard with reasonable facilities, including, where appropriate, food and accommodation; and
- h) facilitate safe disembarkation by the inspectors.

27. If the master of a fishing vessel refuses to allow an authorized inspector to carry out a boarding and inspection in accordance with these procedures, such master shall offer an explanation of the reason for such refusal. The authorities of the inspection vessel shall immediately notify the authorities of the fishing vessel, as well as the Commission, of the master's refusal and any explanation.

28. The authorities of the fishing vessel, unless generally accepted international regulations, procedures and practices relating to safety at sea make it necessary to delay the boarding and inspection, shall direct the master to accept the boarding and inspection. If the master does not comply with such direction, the Member shall suspend the vessel's authorization to fish and order the vessel to return immediately to port. The Member shall immediately notify the authorities of the inspection vessel and the Commission of the action it has taken in these circumstances.

Use of Force

29. The use of force shall be prohibited except when and to the degree necessary to ensure the safety of the inspectors during the conduct of their boarding and inspection activities. The degree of force used shall not exceed that reasonably required in the circumstances.

30. Any incident involving the use of force shall be immediately reported to the authorities of the fishing vessel, as well as to the Executive Secretary for distribution to the Commission.

Inspection Reports

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31. Authorized inspectors shall prepare a full report on each boarding and inspection they carry out pursuant to these procedures in accordance with a format specified by the Commission. The authorities of the inspection vessel from which the boarding and inspection was carried out shall transmit a copy of the boarding and inspection report to the authorities of the fishing vessel being inspected, as well as the Secretariat, within 3 (three) full working days of the completion of the boarding and inspection. Where it is not possible for the authorities of the inspection vessel to provide such report to the authorities of the fishing vessel within this timeframe, the authorities of the inspection vessel shall inform the authorities of the fishing vessel and shall specify the time period within which the report will be provided.
32. Such report shall include the names and authority of the inspectors and clearly identify any observed activity or condition that the authorized inspectors believe to be a violation of the Convention or conservation and management measures in force and indicate the nature of specific factual evidence of such violation.

Serious Violations

33. In the case of any boarding and inspection of a fishing vessel during which the authorized inspectors observe an activity or condition that would constitute a serious violation, as defined in paragraph 38, the authorities of the inspection vessels shall immediately notify the authorities of the fishing vessel, directly as well as through the Commission.
34. Upon receipt of a notification under paragraph 33, the authorities of the fishing vessels shall without delay:
 - a) assume their obligation to investigate and, if the evidence warrants, take enforcement action against the fishing vessel in question and so notify the authorities of the inspection vessel, as well as the Commission; or
 - b) authorize the authorities of the inspection vessel to complete investigation of the possible violation and so notify the Commission.
35. In the case of 34(a) above, the authorities of the inspection vessel shall provide, as soon as practicable, the specific evidence collected by the authorized inspectors to the authorities of the fishing vessel.
36. In the case of 34(b) above, the authorities of the inspection vessel shall provide the specific evidence collected by the authorized inspectors, along with the results of their investigation, to the authorities of the fishing vessel immediately upon completion of the investigation.

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37. Upon receipt of a notification pursuant to paragraph 33, the authorities of the fishing vessel shall make best effort to respond without delay and in any case no later than within 3 (three) full working days.
38. For the purposes of these procedures, a serious violation means the following violations of the provisions of the Convention or conservation and management measures adopted by the Commission:
- a) fishing without a valid license, permit or authorization issued by the Member whose flag the fishing vessel is entitled to fly, in accordance with Article 13 of the Convention;
 - b) significant failure to maintain records of catch and catch-related data in accordance with the Commission's reporting requirements or significant misreporting of such catch and/or catch-related data;
 - c) fishing in a closed area;
 - d) fishing during a closed season;
 - e) intentional taking or retention of species in contravention of any applicable conservation and management measure adopted by the Commission;
 - f) significant violation of catch limits or quotas in force pursuant to the Convention;
 - g) using prohibited fishing gear;
 - h) falsifying or intentionally concealing the markings, identity or registration of a fishing vessel;
 - i) concealing, tampering with or disposing of evidence relating to investigation of a violation;
 - j) multiple violations which taken together constitute a serious disregard of measures in force pursuant to the Commission;
 - k) refusal to accept a boarding and inspection, other than as provided in paragraphs 27 and 28;
 - l) assault, resist, intimidate, sexually harass, interfere with, or unduly obstruct or delay an authorized inspector; and
 - m) intentionally tampering with or disabling the vessel monitoring system;
 - n) such other violations as may be determined by the Commission, once these are included and circulated in a revised version of these procedures.

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Enforcement

39. Any evidence obtained as a result of a boarding and inspection pursuant to these procedures with respect to violation by a fishing vessel of the Convention or conservation and management measures adopted by the Commission and in force shall be referred to the authorities of the fishing vessel for action in accordance with Article 17 of the Convention.
40. For the purposes of these procedures, the authorities of the fishing vessels shall regard interference by their fishing vessels, captains or crew with an authorized inspector or an authorized inspection vessel in the same manner as any such interference occurring within its exclusive jurisdiction.

Annual Reports

41. Contracting Parties that authorize inspection vessels to operate under these procedures shall report annually to the Commission on the boarding and inspections carried out by its authorized inspection vessels, as well as upon possible violations observed.
42. Contracting Parties shall include in their annual statement of compliance within their Annual Report to the Commission under Article 16 of the Convention action that they have taken in response to boarding and inspections of their fishing vessels that resulted in observation of alleged violations, including any proceedings instituted and sanctions applied.

Other Provisions

43. Authorized inspection vessels, while carrying out activities to implement these procedures, shall engage in surveillance aimed at identifying fishing vessels of non-Members undertaking fishing activities on the high seas in the Convention area. Any such vessels identified shall be immediately reported to the Executive Secretary for distribution to the Commission.
44. The authorized inspection vessel shall attempt to inform any fishing vessel identified pursuant to paragraph 43 that has been sighted or identified as engaging in fishing activities that are undermining the effectiveness of Convention and that this information will be sent to the Executive Secretary for distribution to the Members of the Commission and the non-Member whose flag the fishing vessel is entitled to fly of the vessel in question.

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45. If warranted, the authorized inspectors may request permission from the fishing vessel and/or the non-Member whose flag the vessel is entitled to fly to board a vessel identified pursuant to paragraph 43. If the vessel master or the vessel's non-Member whose flag the vessel is entitled to fly consents to a boarding, the findings of any subsequent inspection shall be transmitted to the Executive Secretary. The Executive Secretary shall distribute this information to all Commission Members as well as to the non-Member whose flag the vessel is entitled to fly.
46. Contracting Parties shall be liable for damage or loss attributable to their action in implementing these procedures when such action is unlawful or exceeds that reasonably required in the light of available information.

Commission Coordination and Oversight

47. Authorized inspection vessels in the same operational area should seek to establish regular contact for the purpose of sharing information on areas in which they are patrolling, on sightings and on boarding and inspections they have carried out, as well as other operational information relevant to carrying out their responsibilities under these procedures.
48. The Commission shall keep under continuous review the implementation and operation of these procedures, including review of annual reports relating to these procedures provided by Members. In applying these procedures, Contracting Parties may seek to promote optimum use of the authorized inspection vessels and authorized inspectors by:
 - a) identifying priorities by area and/or by fishery for boarding and inspections pursuant to these procedures;
 - b) ensuring that boarding and inspection on the high seas is fully integrated with the other monitoring, compliance and surveillance tools available pursuant to the Convention;
 - c) ensuring non-discriminatory distribution of boarding and inspections on the high seas among fishing vessels of Members of the Commission without compromising the opportunity of Contracting Parties to investigate possible serious violations; and
 - d) taking into account high seas enforcement resources assigned by Members of the Commission to monitor and ensure compliance by their own fishing vessels, particularly for small boat fisheries whose operations extend onto the high seas in areas adjacent to waters under their jurisdiction.

Settlement of Disagreements

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49. In the event of a disagreement concerning the application or implementation of these procedures, the parties concerned shall consult in an attempt to resolve the disagreement.
50. If the disagreement remains unresolved following the consultations, the Executive Secretary of the Commission shall, at the request of the parties concerned, and with the consent of the Commission, refer the disagreement to the Technical and Compliance Committee (TCC). The TCC shall establish a panel of five representatives, acceptable to the parties to the disagreement, to consider the matter.
51. A report on the disagreement shall be drawn up by the panel and forwarded through the TCC Chair to the Executive Secretary for distribution to the Commission within two months of the TCC meeting at which the case is reviewed.
52. Upon receipt of such report, the Commission may provide appropriate advice with respect to any such disagreement for the consideration of the Members concerned.
53. Application of these provisions for the settlement of disagreements shall be non-binding. These provisions shall not prejudice the rights of any Member to use the dispute settlement procedures provided in the Convention.

Boarding Ladder Guidelines

Commencing on March 1st, 2022, the Master of a fishing vessel with fishing vessel with a registered tonnage greater than or equal to 250 GT (Gross Tonnage) or GRT (Gross Register Tonnage), as registered in the NPFC Vessel Registry, is encouraged to provide a board ladder that meets the following guidelines:

- a) A boarding ladder shall be provided for the purpose of enabling Authorized Inspectors to safely embark and disembark at-sea pursuant to the provisions of CMM 2023-09.
- b) The ladder shall be secured in an area that is clear of any possible discharges, lines, or obstructions from the vessel.
- c) The ladder shall be placed as near to the mid-length of the vessel as practicable.
- d) Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder and vice versa.
- e) The rigging of the ladder and the embarkation and disembarkation of an Authorized Inspector shall be overseen by a responsible crew member of the vessel, who shall have communication with the bridge.
- f) The steps of the ladder shall be:
 - i) made of hardwood (or of a suitable equivalent material).
 - ii) free from sharp edges or splinters.
 - iii) provided with an effective non-slip surface.
 - iv) not less than 480 mm long, 115 mm wide and 25 mm in depth.
 - v) equally spaced apart to ensure safe and ergonomic climbing of the ladder by an Authorized Inspector.
 - vi) secured in such a manner that they will remain horizontal.
- g) The side ropes of the ladder shall:
 - i) consist of two uncovered manila ropes not less than 65 mm in circumference on each side.
 - ii) shall be continuous with no joins.
 - iii) shall have ends secured to prevent unravelling.
 - iv) Battens (span boards) made of hardwood or a material of equivalent properties, in one piece, shall be provided to prevent the boarding ladder from twisting.
 - v) An authorized inspector shall have the discretion to instruct a vessel master to move or reconfigure the boarding ladder if deemed unsafe for use.

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Note: A graphic regarding the boarding ladder is attached hereto.

CMM 2023-01

(Entered into force dd mm 2023)

**CONSERVATION AND MANAGEMENT MEASURE ON INFORMATION
REQUIREMENTS FOR VESSEL REGISTRATION**

The North Pacific Fisheries Commission (NPFC),

Recalling Article 4 of the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas of 24 November 1993 that stipulates to maintain a record of fishing vessels entitled to fly its flag and authorized to be used for fishing on the high seas, and to take such measures as may be necessary to ensure that all such fishing vessels are entered in that record,

Recognizing Article 7, paragraph 2 (d) of the Convention regarding the establishment of appropriate cooperative mechanisms for effective monitoring, control and surveillance to ensure enforcement of the conservation and management measures adopted by the Commission including mechanisms to prevent, deter and eliminate IUU fishing,

Reaffirming that Article 13, paragraph 1 of the Convention that members of the Commission or Cooperating non-Contracting Parties shall take necessary measures to ensure that fishing vessels entitled to fly its flag operating in the Convention Area comply with the provisions of the Convention and measures adopted pursuant to the Convention and such vessels do not engage in any activities that undermine the effectiveness of such measures and do not conduct unauthorized fishing activities within areas under national jurisdiction of another State adjacent to the Convention Area,

Also reaffirming that Article 13, paragraph 2 of the Convention that no members or Cooperating non-Contracting Parties of the Commission shall allow any fishing vessel entitled to fly its flag to be used for fishing activities in the Convention Area unless it has been authorized to do so by the appropriate authority or authorities of that member of the Commission or Cooperating non-Contracting Parties. Each member of the Commission, or Cooperating non-Contracting Parties, shall authorize the use of vessels entitled to fly its flag in the Convention Area only where it is able to exercise effectively its responsibilities in respect of those vessels under this Convention, the 1982 Convention and the 1995 Agreement,

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Also recognizing that members of the Commission or Cooperating non-Contracting Parties have the need to conduct transshipment with carrier vessels that are flagged to Commission members, Cooperating non-Contracting Parties,

Noting the decision by the IMO Assembly in its 30th session to expand eligibility for IMO numbers to fishing vessels less than 100 gross tons down to a size limit of 12 meters in length overall authorized to operate outside waters under national jurisdiction of the flag State to assist in identifying and tracking fishing vessels and to tackle illegal, unreported and unregulated fishing,

Adopts the following conservation and management measures in accordance with Article 7, Article 13, paragraph 8 and Article 15 of the Convention:

NPFC Vessel Registry

For the purpose of the effective implementation of the Convention, each Commission member or Cooperating non-Contracting Party shall:

1. Maintain a record of fishing vessels entitled to fly its flag and authorized to be used for fishing activities in the Convention Area in accordance with the information requirements in the Annex.
2. Update pertinent information required from paragraph 1 in the NPFC Vessel Registry established under Article 13, paragraph 10 of the Convention, noting that vessel submissions which do not include the initial data elements as indicated in the Annex will not be accepted by the database.
3. Promptly update the NPFC Vessel Registry with:
 - a) any additions to the record; e.g. new vessel authorizations;
 - b) any modifications to this information with dates of such modifications; and
 - c) any deletions from the record, specifying which of the following reasons is applicable:
 - i) the voluntary relinquishment of the fishing authorization by the fishing vessel owner or operator;
 - ii) the withdrawal or non-renewal of the fishing authorization issued in respect of the fishing vessel under Article 13, paragraph 2 of the Convention;
 - iii) the fact that the fishing vessel concerned is no longer entitled to fly its flag;
 - iv) the scrapping, decommissioning, or loss of the fishing vessel concerned; or

- v) any other grounds, with a specific explanation provided.
4. Provide to the Commission, as part of the annual report required pursuant to Article 16 of the Convention, the names of the fishing vessels entered in the record that conducted fishing activities during the previous calendar year.

Vessel Marking

5. Each Commission Member and Cooperating non Contracting Party shall ensure that every fishing vessel authorized to fly its flag bear markings that are readily identified in accordance with the FAO Standard Specifications for the Marking and Identification of Fishing Vessels, and recognize that non-compliance with these standards shall be considered a serious violation according to Article 17, paragraph 5 of the NPFC Convention and Article 21 Paragraph 11(f) of the United Nations Fish Stocks Agreement.

General

6. Commission Members and Cooperating non-Contracting Parties shall ensure they have maintained the NPFC Vessel Registry of the vessels based on the information provided to it and make the record publicly available as appropriate and subject to any legal confidentiality regulations of the individual Commission member and Cooperating non-Contracting Party.
7. The Commission member or Cooperating non-Contracting Parties entering vessels identified in paragraph 2 on the NPFC Vessel Registry established under paragraph 1 shall attest that the vessel or vessels being added recommended are not vessels:
 - a) with a history of illegal, unreported or unregulated (IUU) fishing, unless the ownership of the vessel has subsequently changed and the new owner has provided sufficient evidence demonstrating that the previous owner or operator has no legal, beneficial or financial interest in, or control of the vessels, or Commission members or Cooperating non-Contracting Parties concerned is satisfied that, having taken into account all relevant facts, the vessel is no longer engaged in or associated with IUU fishing; or
 - b) that are currently listed on any of the IUU vessel lists adopted by regional fishery management organizations (RFMOs)
8. If a fishing vessel with such an IUU history or on an RFMO IUU Vessel list as noted in paragraph 7 without the appropriate justification noted therein, is uploaded to, or found on the NPFC Vessel

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Registry, the Executive Secretary shall remove the vessel from the appropriate vessel registry with notification of such action to the flag member.

9. Each Commission Member and Cooperating non-Contracting Party entering vessels on the NPFC Vessel Registry must enter the required data for its vessels, immediately after it has so authorized the vessel to conduct fishing activities.
10. An authorized vessel cannot conduct fishing activities in the Convention Area until the vessel has been accepted in the NPFC Vessel Registry.
11. The Commission shall also provide to any Commission Member or Cooperating non-Contracting Party, upon request, information about any vessel entered on the Commission record that is not otherwise publicly available, as appropriate.
12. This CMM shall replace the NPFC CMM 2021-01.

List of Fields in the NPFC Vessel Registry and their Format and Content

“Asterisks (*) denote ‘initial data elements’ required to commence fishing activities in the Convention Area.”

	Field	Field Name	Field Format	Field Description/ Instructions	Example	Ref.
		NPFC ID	Number (integer)	This number is assigned automatically upon entry of vessel information.	1099	
*	(a)	Flag State	Text	The registered flag state – in UPPER CASE.	CANADA	
*	(b)	Authorizing Member	Text	Country/Member name – in UPPER CASE.	CHINA	
*	(c)	Name of fishing vessel	Text	Name of the fishing vessel as indicated on flag State registration – in UPPER CASE.	HAPPY NO. 123	CMM 2019-01
(where applicable)	(d)	Previous name(s) of fishing vessel	Text	List of the previous name(s) of the fishing vessel in UPPER CASE. <ul style="list-style-type: none"> If the Member/CNCP knows the vessel has no previous names, use “N/A”. 	UNHAPPY NO. 1; IMHERE NO. 2	CMM 2019-01

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				<ul style="list-style-type: none"> If the Member/CNCP does not know if the vessel has any previous names, use “NONE KNOWN”. <p>If multiple previous vessel names, separate entries with “;” (semi-colon).</p>		
*	(e)	Registration number	Text	Alphanumeric registration identifier assigned by the flag country/Member, as indicated on flag country/Member registration – in UPPER CASE.	ABCD1234	CMM 2019-01
(where applicable)	(f)	Previous registration number(s)	Text	Alphanumeric registration identifier assigned by the flag country, as indicated on flag State registration – in UPPER CASE. If multiple previous registration numbers, separate entries with “;” (semi-colon).	EFGH5678; IJKL0109	CMM 2019-01
	(g)	Port of registry	Text	Country/Member name – in UPPER CASE.	PANAMA	CMM 2019-01
(where applicable)	(h)	Previous port(s) of registry	Text	Country/Member name – in UPPER CASE, If multiple previous ports of registry,	CANADA ; JAPAN	CMM 2019-01

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				separate entities with “;” (semi-colon).		
*	(i)	IMO number* *Required for vessels which are eligible to receive IMO numbers	Number (integer)	A seven-digit number assigned to all vessels by HIS. All fishing vessels are required to have an IMO number.	1234567	CMM 2019-01
*	(j)-1	Name of owner(s)	Text	All in UPPER CASE. If multiple owners, separate entries with “;”. If company, enter full name of the company. If personal name, enter last/family name, first/given name(s) (separated by a comma).	DOE, JANE; GOOD CATCH INC.;	CMM 2019-01
*	(j)-2	Address of owner(s)	Text	All in UPPER CASE. Separate components of each address with a comma. If more than one address, separate addresses with “;” (semi-colon).	2F, HAKUYO HALL, TOKYO UNIVERSITY OF MARINE AND TECHNOLOGY, 4-5-7 KONAN, MINATO-KU TOKYO 108-8477 JAPAN.	CMM 2019-01

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*	(k)-1	Name of master	Text	All in UPPER CASE. Enter last/family name, first/given name(s).	DOE, JANE	CMM 2019-01
*	(k)-2	Citizenship of master	Text	All in UPPER CASE. If multiple masters, separate entries with “;” (semi-colon).	RUSSIA	CMM 2019-01
(if any)	(l)	Previous flag	Text	List previous flag(s) of the vessel, if any. • If vessel has no previous flag, enter “N/A”. If multiple previous flags, separate entries with “;” (semi-colon).	JAPAN; REPUBLIC OF KOREA	CMM 2019-01
* (where applicable)	(m)	International Radio Call Sign (IRCS)	Text	Alphanumeric code. All in CAPS without space.	BZ1VK	CMM 2019-01
(where applicable)	(n)	Maritime Mobile Service Identity (MMSI)	Number (integer)	A nine-digit number.	12345678 9	CMM 2019-01
	(o)	Vessel communication types and numbers, including when available: satellite-based telephony or data services/devices.	Number	Enter description of each of any communication devices on board the vessel that use Inmarsat A, B, or C, or that have a satellite telephone number.	C:123344 556	CMM 2019-01

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				If no such communication devices are on board, enter “NONE”.		
*	(p)	Vessel Photo Full length color photograph(s) showing Side view including IRCS. Photographs must show clear and unobstructed views that demonstrate compliance with vessel marking requirements to be accepted by the Secretariat for addition to the database; Provision of additional photographs showing bow and stern view are encouraged	PNG JPEG	Upload file containing vessel photo. Enter the name of the electronic data file, using the following format: [NPFC ID #]_[Vessel Name]_[Date of Photograph: dd.mm.yyyy]	1551_JOY NO. 345_06.12 .2019	CMM 2019-01
*	(q)-1	Where (country/Member) built.	Text	Country/Member name – in UPPER CASE.	JAPAN	CMM 2019-01
*	(q)-2	When built (year).	Number (integer)	Enter the year the vessel was built in.	1996	CMM 2019-01
*	(r)	Type of vessel, as specified in	Text		JIGGER VESSELS	CMM 2019-01

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		standard abbreviations under the current <i>FAO International Standard Statistical Classification of Fishery Vessels by Vessel Types</i> (ISSCFV).		Enter vessel type(s) as listed under the FAO ISSCFV.		
	(s)	Normal crew complement	Number (integer)	The number of crew members normally on board the vessel, including officers.	35	CMM 2019-01
	(t)	Type of gear Type of fishing method or methods, as specified in standard abbreviations under the current <i>FAO International Standard Statistical Classification of Fishing Gear</i> (ISSCFG) and additions as requested by Members to accommodate gear not in the ISSCFG.	Text	Enter gear type(s) as listed under the FAO ISSCFG.	LIFT NETS (NEI)	CMM 2019-01

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*	(u)-1	Type of length [Length*, including type of length* and unit of measurement.*]	Text	Enter length overall (LOA), length between perpendiculars, waterline length, or registered length.	Length overall (LOA)	CMM 2019-01
*	(u)-2	Length	Number (decimal)		109.00	CMM 2019-01
*	(u)-3	Length measurement unit	Text	Enter metres or feet.	Metres	CMM 2019-01
	(v)-1	Type of Depth [Depth, including type of depth and unit of measurement.]	Text	Enter draft/draught or moulded depth.	Draft/draught Moulded depth	CMM 2019-01
	(v)-2	Depth	Number (decimal)		10.50	
	(v)-3	Depth measurement unit	Text	Enter metres or feet.	Metres	CMM 2019-01
*	(w)-1	Type of beam [Beam*, including type of beam* and unit of measurement.*]	Text	Enter moulded breadth or extreme breadth.	Moulded breadth.	CMM 2019-01
*	(w)-2	Beam	Number (decimal)		18.00	CMM 2019-01
*	(w)-3	Beam measurement unit	Text	Enter metres or feet.	Metres	CMM 2019-01
*	(x)-1	Tonnage	Number (decimal)		5005.00	CMM 2019-01

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		[Gross register tonnage*, or gross tonnage* (specify which)]				
*	(x)-2	Tonnage type	Text	Enter gross register tonnage (GRT) or gross tonnage (GT).	GRT	CMM 2019-01
	(y)-1	Power of main engine or engine(s) [Power of main engine or engines, including unit of measurement.]	Number (decimal)		3000.00	CMM 2019-01
	(y)-2	Engine measurement unit	Text	Enter kilowatts (kW), horsepower (hp), or pferdestärke.	Kilowatts (kW)	CMM 2019-01
*	(z)	Domestic Licence Authorization The nature of authorization to fish granted by the flag state in its domestic licence, such as type or method of fisheries authorized and main target species, and	Text and/or number. For date - DAY/MONTH/YEAR	Enter start and end dates of domestic licence authorization, target species, and authorization number.	12-05-2019 – 11-10-2020 Pacific Saury 1135	CMM 2019-01

Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

		authorized periods.				
*	(z)-1	<p>NPFC Commission Authorization period – the dates for the authorization to operate in the NPFC Convention Area by the Member commencing on the date of notification of the authorization to extend to the date of the domestic authorization period up to a maximum of five years from the notification date.</p> <p>Gear and species will be same as ‘Domestic Licence’, but identified according to the drop down list of individual target species (see example).</p>	For date – DAY/MONTH/YEAR	<p>System automatically enters notification date for commencement of authorization; Member enters end date, e.g., date of licence period if within 5 years from notification date, OR maximum of 5-year period from notification date.</p> <p>The target species for each authorization period must be listed separately</p>	28 November 2020 – 27 November 2025 and species from drop down list – one of: Bottom fish; Mackerel; Japanese flying squid; neon flying squid; Japanese sardine, etc.. (maximum authorization period)	CMM 2019-01
	(aa)	Fish hold capacity, in cubic metres.	Number (decimal)	The total amount of fish capable of being stored on the vessel,	7151.00 m ³	CMM 2019-01

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				excluding bait and fish kept for crew consumption.		
	(bb)	Freezer: number of freezers, type(s), capacity, and unit of measurement. [Freezer type and capacity, including unit of measurement.]	Text; Number (decimal)	Freezer type: enter ice, brine, air blast, air coil, and/or plate freezer. Capacity unit: enter tons/day, metric ton/day, lbs/day, cubic metres, and/or cubic feet.	2-Air blast-55 cubic metres	CMM 2019-01

Specifications for the Marking and Identification of Fishing Vessels

Purpose

1. These specifications are intended to implement the *FAO Standard Specifications for the Marking and Identification of Fishing Vessels* for the North Pacific Fisheries Commission (NPFC).

General Provisions

2. Each Commission Member and Cooperating non-Contracting Party shall ensure that each fishing vessel entitled to fly its flag and authorized to be used for fishing in the Convention Area is:
 - a) marked and identifiable with their International Telecommunication Union Radio Call Sign (IRCS); and
 - b) where an IRCS has not been assigned, the vessel shall be marked and identifiable with the characters allocated by the International Telecommunication Union (ITU) to the flag State and followed by, as appropriate, the licence or registration number assigned by the flag State. In such cases, a hyphen shall be placed between the nationality identification characters, and the licence or registration number identifying the vessel.
3. In order to avoid confusion with the letters I and O, it is recommended that the numbers 1 and 0, which are specifically excluded from the ITU call signs, be avoided by national authorities when allocating licence or registration numbers.
4. Apart from the fishing vessel's name or identification mark and the port of registry as required by international practice or national legislation, the marking system as specified shall, in order to avoid confusion, be the only other vessel identification mark consisting of letters and numbers to be painted on the hull or superstructure.

Application of Markings

5. Each Commission Member and Cooperating non-Contracting Party shall ensure that the markings are prominently displayed at all times:
 - a) on the vessel's side or superstructure, port and starboard; fixtures inclined at an angle to the vessel's side or superstructure are permitted provided that the angle of inclination does not prevent sighting of the sign from another vessel or from the air; and

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- b) on a deck, except as provided for in paragraph 7. Should an awning or other temporary cover be placed so as to obscure the mark on a deck, the awning or cover shall also be marked. These marks should be placed athwartships with the top of the numbers or letters towards the bow.
6. Each Commission Member and Cooperating non-Contracting Party shall ensure that markings are:
- a) placed as high as possible above the waterline on both sides, and that such parts of the hull as the flare of the bow and the stern shall be avoided;
 - b) so placed as to not be obscured by the fishing gear whether it is stowed or in use;
 - c) clear of flow from scuppers or overboard discharges including areas which might be prone to damage or discolouration from the catch of certain types of species; and
 - d) not extended below the waterline.
7. Undecked vessels shall not be required to display the markings on a horizontal surface. However, owners should be encouraged, where practical, to fit a board on which the markings may be clearly seen from the air.
8. Vessels fitted with sails may display the markings on the sail in addition to the hull.
9. Boats, skiffs, and craft carried by the vessel for fishing operations shall bear the same mark as the vessel concerned.

Specifications for Markings

10. Each Commission Member and Cooperating non-Contracting Party shall ensure that:
- a) block lettering and numbering is used throughout;
 - b) the width of the letters and numbers is in proportion to the height;
 - c) the height (*h*) of the letters and the numbers shall be in proportion to the size of the vessel in accordance with the following:
 - i) for marks to be placed on the hull, superstructure, and/or inclined surfaces:

<u>Length of vessel overall (LOA) in metres (m)</u>	Height of letters and numbers in metres (m) is not less than:
25 m and over	1.0 m

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20 m but less than 25 m	0.8 m
15 m but less than 20 m	0.6 m
12 m but less than 15 m	0.4 m
5 m but less than 12 m	0.3 m
Under 5 m	0.1 m

- ii) for marks to be placed on deck: the height shall not be less than 0.3 metres (m) for all classes of vessels of 5 metres (m) and over.
- d) the length of the hyphen shall be half the height of the letters and numbers;
- e) the width of the stroke for all letters, numbers, and the hyphen shall be $h/6$;
- f) the space between letters and/or numbers shall not exceed $h/4$, nor be less than $h/6$; and
- g) the space between adjacent letters having sloping sides shall not exceed $h/8$, nor be less than $h/10$, for example A V.

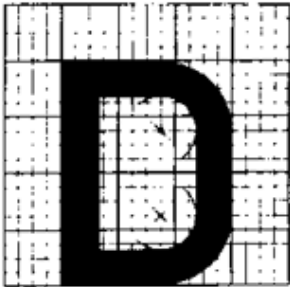
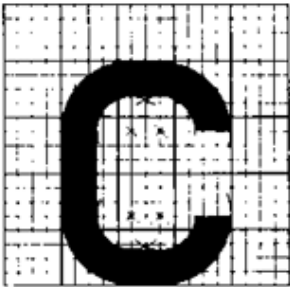
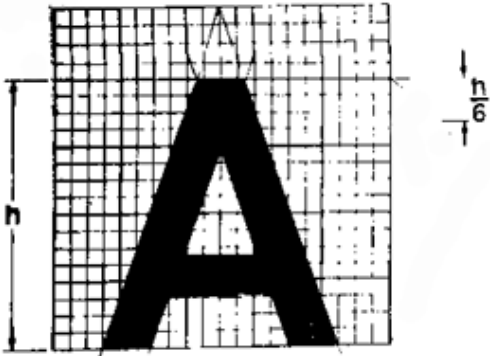
Specifications for Painting of Markings

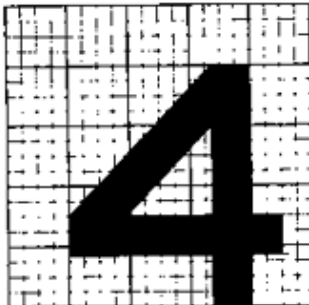
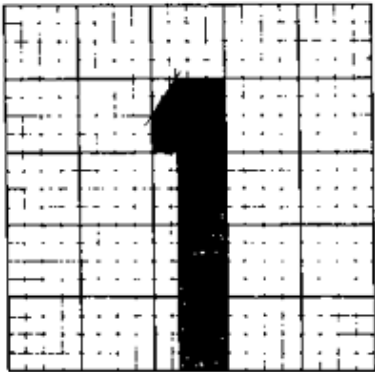
11. Each Commission Member and Cooperating non-Contracting Party shall ensure that:

- a) the markings are either white on a background, or black on a white background;
- b) the background shall extend to provide a border around the mark of not less than $h/6$;
- c) good quality marine paint is used throughout;
- d) where retro-reflective or heat generating substances are used, the markings meet the requirements of this Annex; and
- e) the markings and background are maintained in good condition at all times.

Review and Amendment of Specifications

12. The Commission shall keep these specifications under review, and may amend them as appropriate.

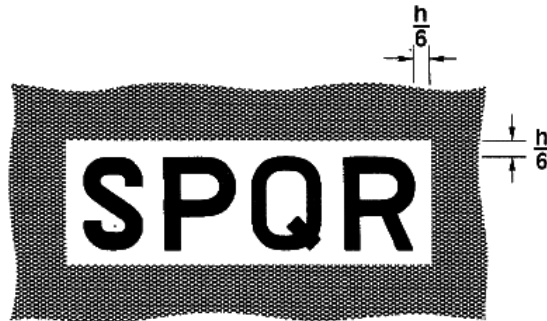




Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Examples of placement of the marks
Exemples d'emplacement des marques
Ejemplos de colocación de las marcas

CONTRAST / CONTRASTE / CONTRASTE



COLOURED BACKGROUND / FOND COLORE / FONDO EN COLOR



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 1
FACTORY TRAWLER

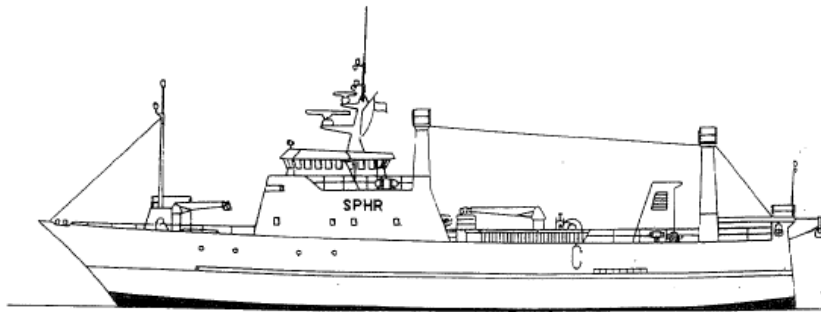
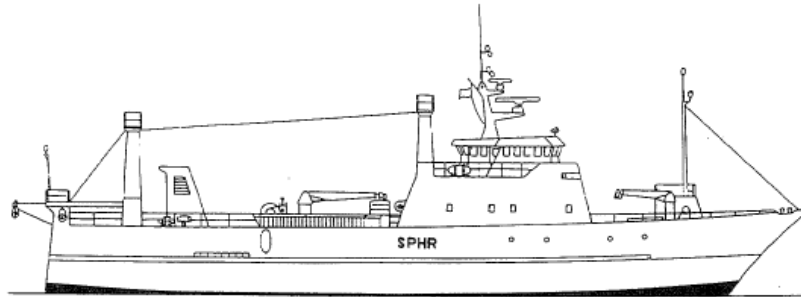
Length over all: 68 m
Call sign: POLAND
Letter height: 1 m

Groupe N° 1
CHALUTIER-USINE

Longueur hors tout: 68 m
Indicatif d'appel: POLOGNE
Hauteur des lettres: 1 m

Grupo N° 1
ARRASTRERO FACTORIA

Eslora máxima: 68 m
Distintivos de llamado: POLONIA
Altura de letra: 1 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 1
TUNA FURSE SEINER

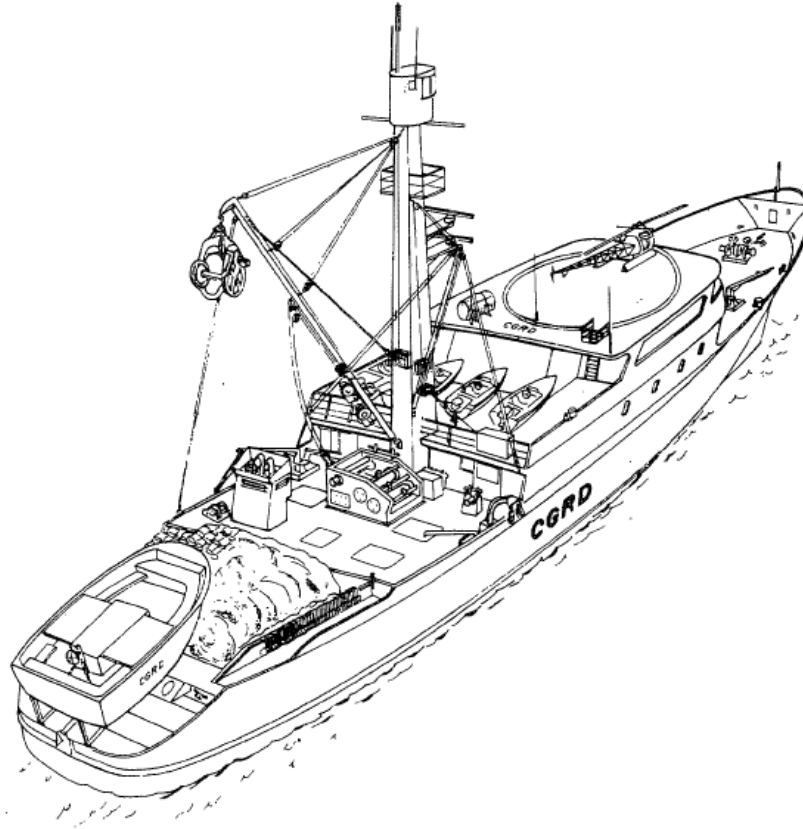
Length over all: 64 m
Call sign: CANADA
Letter height: 1 m
- on superstructure:
0,40 m
- on skiff: 0,40 m

Groupe N° 1
THONIER-SENNEUR

Longueur hors tout: 64 m
Indicatif d'appel: CANADA
Hauteur des lettres: 1 m
- sur les superstructures:
0,40 m
- sur le bateau annexe:
0,40 m

Grupo N° 1
CERQUERO ATUNERO

Eslora máxima: 64 m
Distintivos de llamado: CANADA
Altura de letra: 1 m
- sobre la subestructura:
0,40 m
- sobre la barca auxiliar:
0,40 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 1
POLE AND LINE VESSEL/
AMERICAN TYPE

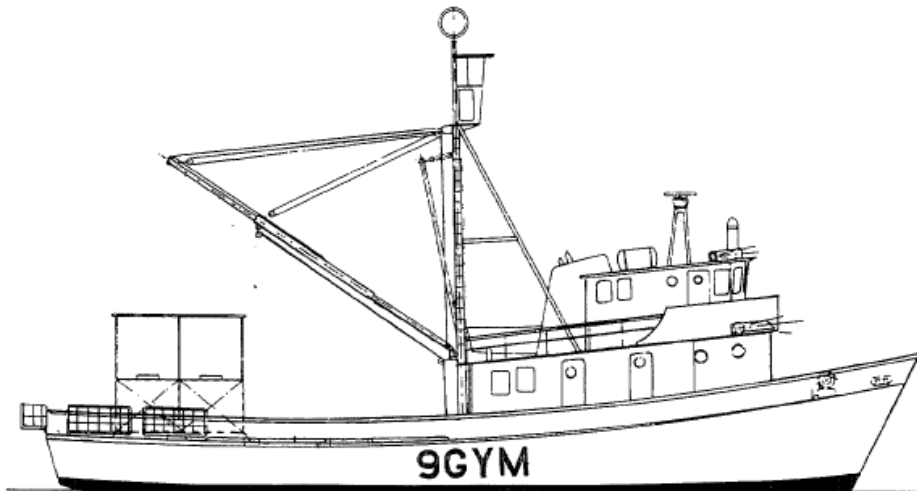
Length over all: 28 m
Call sign: GHANA
Letter height: 1 m

Groupe N° 1
CANNEUR, TYPE AMERICAIN

Longueur hors tout: 28 m
Indicatif d'appel: GHANA
Hauteur des lettres: 1 m

Grupo N° 1
EMBARCACION PARA LA PESCA CON
LINEA Y CAÑA, TIPO AMERICANO

Eslora máxima: 28 m
Distintivos de llamado: GHANA
Altura de letra: 1 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 1
LONGLINER

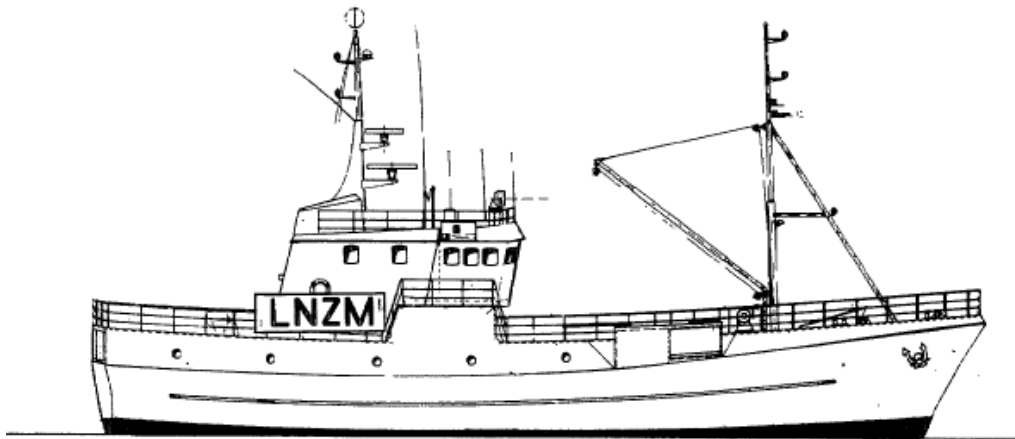
Length over all: 33.50 m
Call sign: NORWAY
Letter height: 1 m

Groupe N° 1
PALANGRIER

Longueur hors tout: 33,50 m
Indicatif d'appel: NORVEGE
Hauteur des lettres: 1 m

Grupo N° 1
PALANGRERO

Eslora máxima: 33,50 m
Distintivos de llamado: NORUEGA
Altura de letra: 1 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 2
POLE AND LINE, JAPANESE
TYPE

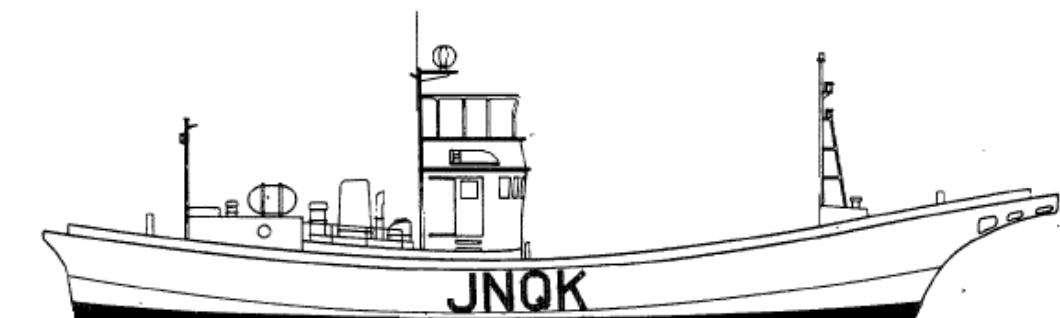
Length over all: 21.55 m
Call sign: JAPAN
Letter height: 0.8 m

Groupe N° 2
CANNEUR, TYPE JAPONAISE

Longueur hors tout: 21,55 m
Indicatif d'appel: JAPON
Hauteur des lettres: 0,8 m

Grupo N° 2
EMBARCACION, PARA LA PESCA CON
LINEA Y CANA, TIPO JAPONES

Eslora máxima: 21,55 m
Distintivos de llamado: JAPON
Altura de letra: 0,8 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 2
PURSE SEINER

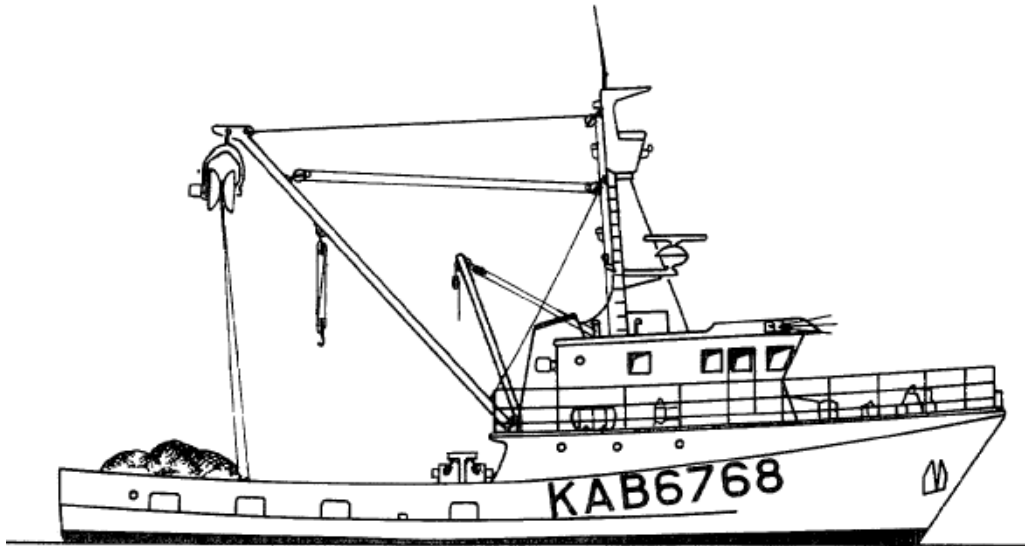
Length over all: 22 m
Call sign: U.S.A.
Letter height: 0.8 m

Groupe N° 2
SENNEUR

Longueur hors tout: 22 m
Indicatif d'appel: ETATS-UNIS
Hauteur des lettres: 0,8 m

Grupo N° 2
CERQUERO

Eslora máxima: 22 m
Distintivos de llamado: ESTADOS
UNIDOS
Altura de letra: 0,8 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 2
SCALLOP DREDGER

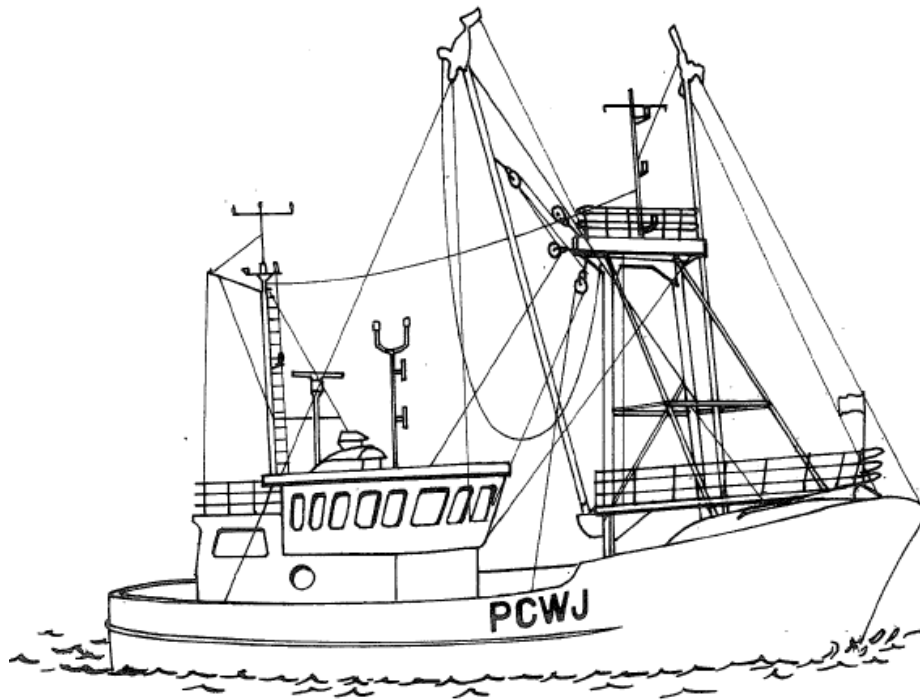
Length over all: 22 m
Call sign: NETHERLANDS
Letter height: 0.8 m

Groupe N° 2
DRAGUEUR

Longueur hors tout: 22 m
Indicatif d'appel: PAYS-BAS
Hauteur des lettres: 0,8 m

Grupo N° 2
RASTRERO

Eslora máxima: 22 m
Distintivos de llamado: PAISES
BAJOS
Altura de letra: 0,8 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 2
TRAWLER/SEINER

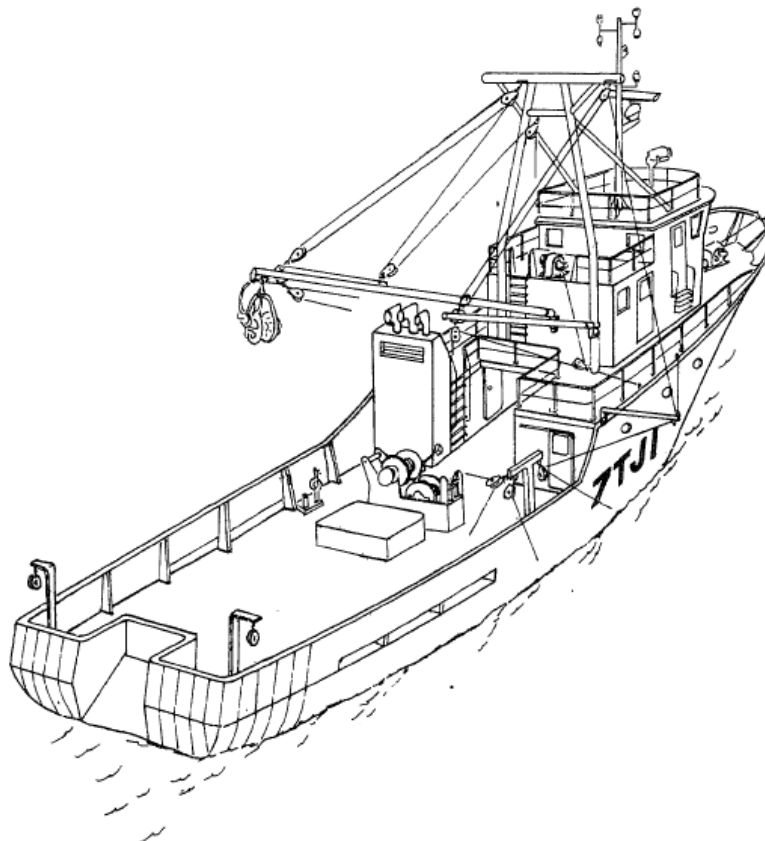
Length over all: 20 m
Call sign: ALGERIA
Letter height: 0.8 m

Groupe N° 2
CHALUTIER-SENNEUR

Longueur hors tout: 20 m
Indicatif d'appel: ALGERIE
Hauteur des lettres: 0,8 m

Grupo N° 2
ARRASTRERO-CERQUERO

Eslora máxima: 20 m
Distintivos de llamado: ARGELIA
Altura de letra: 0,8 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 2
MEDIUM-SIZED SHELTER DECK
STERN TRAWLER

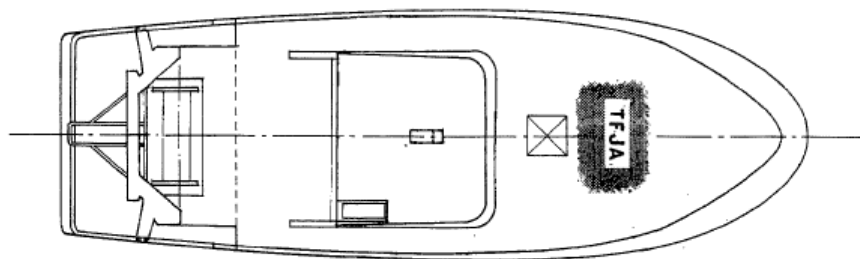
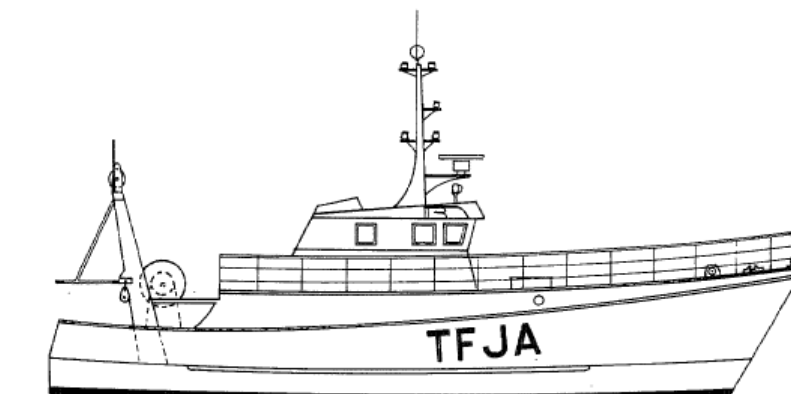
Length over all: 22 m
Call sign: ICELAND
Letter height: 0.8 m
- on deck: 0.3 m

Groupe N° 2
CHALUTIER PECHE ARRIERE DE
TAILLE MOYENNE A PONT COUVERT

Longueur hors tout: 22 m
Indicatif d'appel: ISLANDE
Hauteur des lettres: 0,8 m
- sur le pont: 0,3 m

Grupo N° 2
ARRASTERO POR LA POPA MEDIANO
CON CUBIERTA PROTEGIDA

Eslora máxima: 22 m
Distintivos de llamado:
ISLANDIA
Altura de letra: 0,8 m
- sobre la cubierta: 0,3 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 3
OUTRIGGER TRAWLER

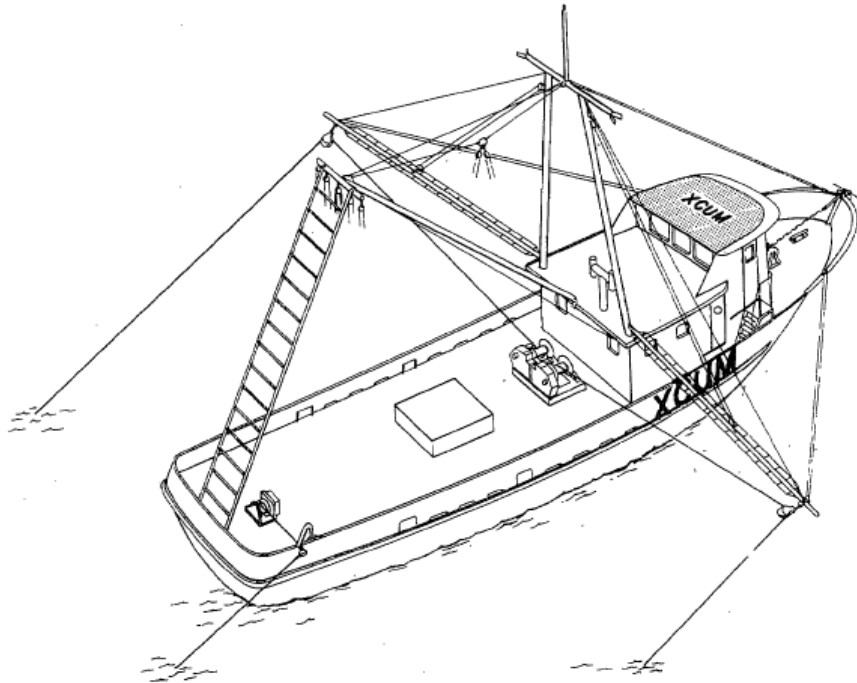
Length over all: 18 m
Call sign: MEXICO
Letter height: 0.6 m
- on wheelhouse top:
0.3 m

Groupe N° 3
CHALUTIER A TANGONS

Longueur hors tout: 18 m
Indicatif d'appel: MEXIQUE
Hauteur des lettres: 0,6 m
- sur le timonerie: 0,3 m

Grupo N° 3
ARRASTRERO CON HORQUETA

Eslora máxima: 18 m
Distintivos de llamado: MEXICO
Altura de letra: 0,6 m
- sobre caseta de gobierno:
0,3 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 3
SEINE NETTER

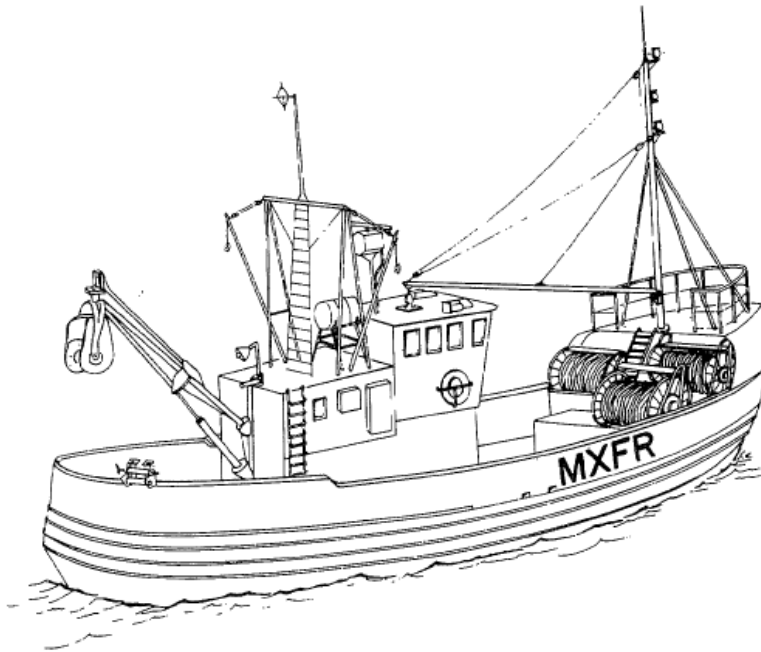
Length over all: 16 m
Call sign: U.K.
Letter height: 0.6 m

Groupe N° 3
SENNEUR A SENNE DE FOND

Longueur hors tout: 16 m
Indicatif d'appel: ROYAUME-
UNI
Hauteur des lettres: 0,6 m

Grupo N° 3
CERQUERO DE RED DE TIRO

Eslora máxima: 16 m
Distintivos de llamado: REINO
UNIDO
Altura de letra: 0,6 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 3
TROLLER

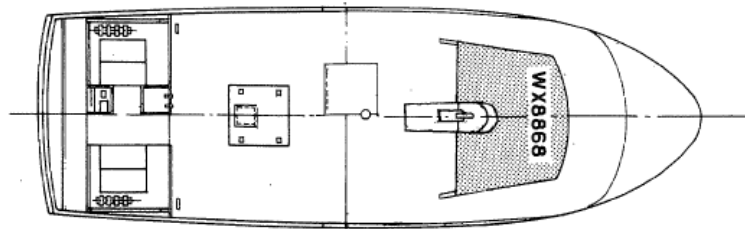
Length over all: 16.80 m
Call sign: U.S.A.
Letter height: 0.6 m
- on wheelhouse: 0.3 m

Groupe N° 3
LIGNEUR A LIGNES DE TRAINÉ

Longueur hors tout: 16,80 m
Indicatif d'appel: ETATS-UNIS
Hauteur des lettres: 0,6 m
- sur le timonerie: 0,3 m

Grupo N° 3
CURRICANERO

Eslora máxima: 16,80 m
Distintivos de llamado: ESTADOS
UNIDOS
Altura de letra: 0,6 m
- sobre caseta de gobierno:
0,3 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 4
SMALL LONGLINER

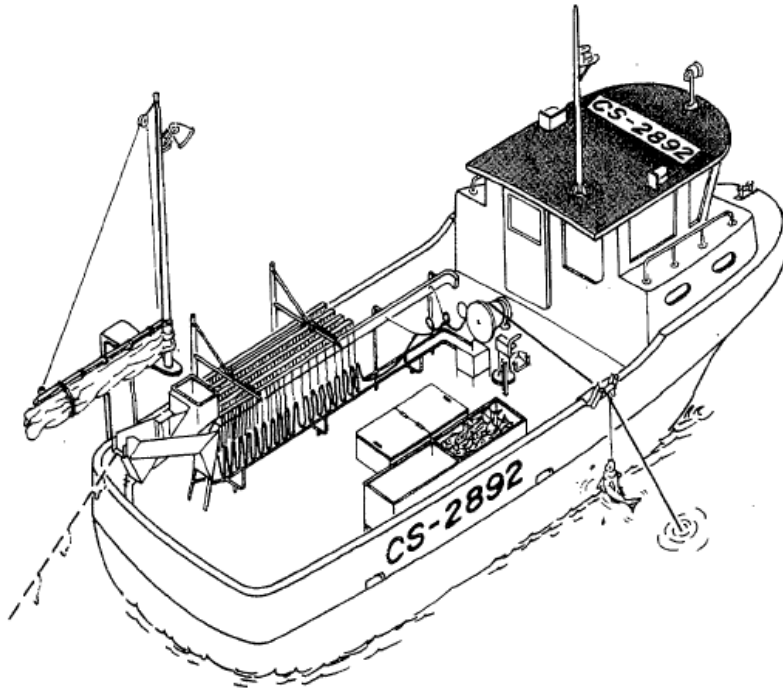
Length over all: 14 m
Call sign: PORTUGAL + No.
Letter height: 0.4 m
- on wheelhouse: 0.3 m

Groupe N° 4
PALANGRIER DE PETITE TAILLE

Longueur hors tout: 14 m
Indicatif d'appel: PORTUGAL
+ N°
Hauteur des lettres: 0,4 m
- sur la timonerie: 0,3 m

Grupo N° 4
PALANGRERO PEQUEÑO

Eslora máxima: 14 m
Distintivos de llamado:
PORTUGAL + N°
Altura de letra: 0,4 m
- sobre la caseta de gobierno:
0,3 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 4
SMALL STERN TRAWLER

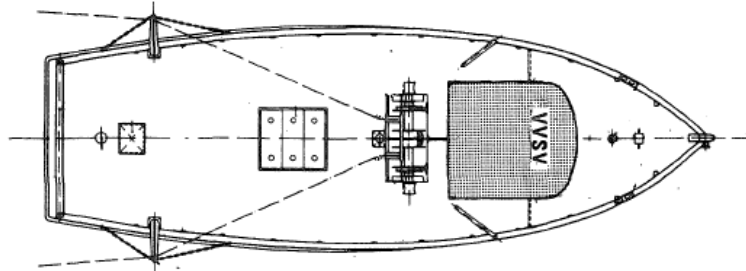
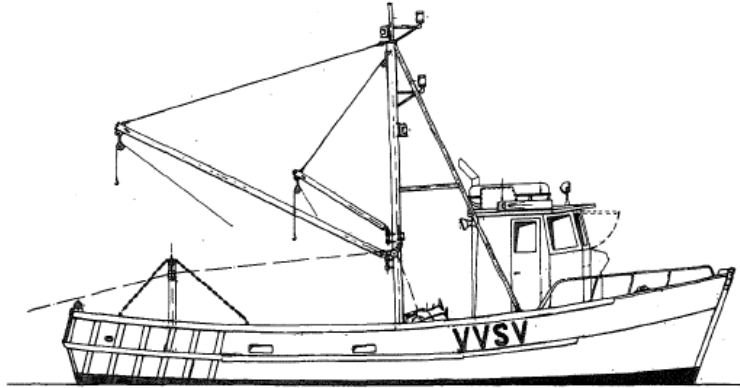
Length over all: 13 m
Call sign: INDIA
Letter height: 0.4 m
- on wheelhouse top:
0.3 m

Groupe N° 4
CHALUTIER PECHE ARRIERE DE
PETITE TAILLE

Longueur hors tout: 13 m
Indicatif d'appel: INDE
Hauteur des lettres: 0,4 m
- sur le timonerie: 0,3 m

Grupo N° 4
ARRASTRERO POR LA POPA PEQUEÑA

Eslora máxima: 13 m
Distintivos de llamado: INDIA
Altura de letra: 0,4 m
- sobre caseta de gobierno:
0,3 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 4
HANDLINER

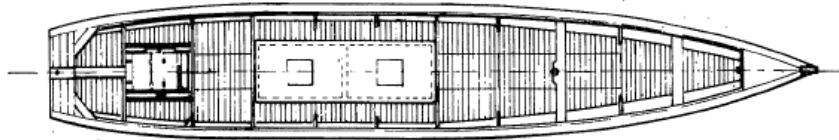
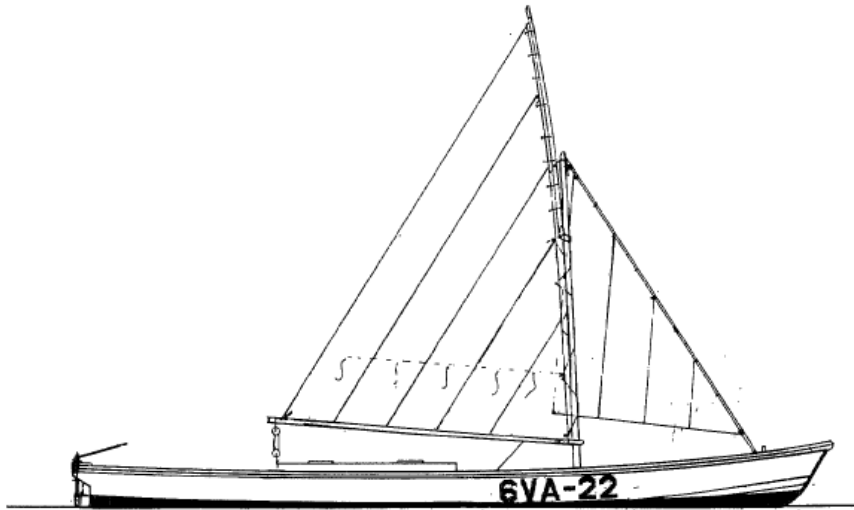
Length over all: 14.80 m
Call sign: SENEGAL + No.
Letter height: 0.4 m

Groupe N° 4
LIGNEUR A LIGNES A MAIN

Longueur hors tout: 14,80 m
Indicatif d'appel: SENEGAL
+ N°
Hauteur des lettres: 0,4 m

Grupo N° 4
EMBARCACION PARA LA PESCA CON
LINEAS DE MANO

Eslora máxima: 14,80 m
Distintivos de llamado: SENEGAL
+ N°
Altura de letra: 0,4 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 5
MULTIPURPOSE VESSEL

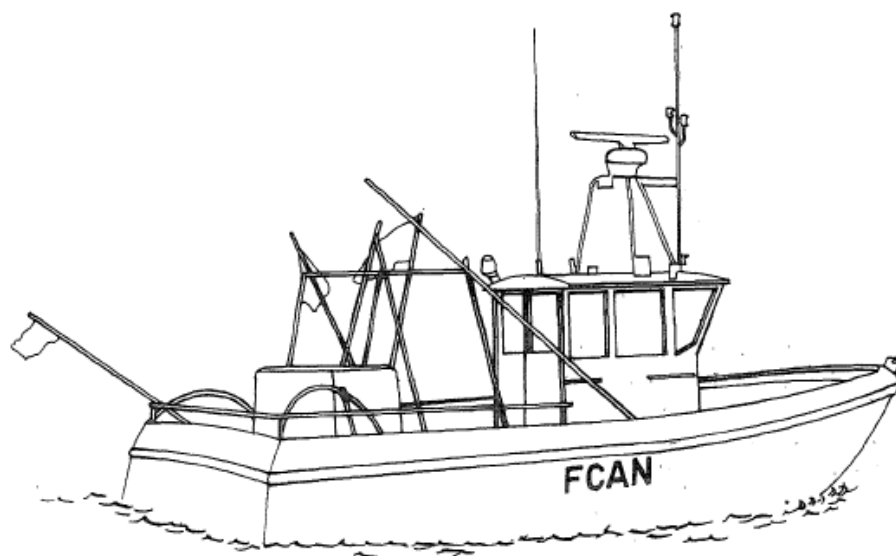
Length over all: 9 m
Call sign: FRANCE
Letter height: 0.30 m

Groupe N° 5
NAVIRE POLYVALENT

Longueur hors tout: 9 m
Indicatif d'appel: FRANCE
Hauteur des lettres: 0,30 m

Grupo N° 5
EMBARCACION POLYVALENT

Eslora máxima: 9 m
Distintivos de llamado: FRANCIA
Altura de letra: 0,30 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 5
VESSEL WITH SAIL

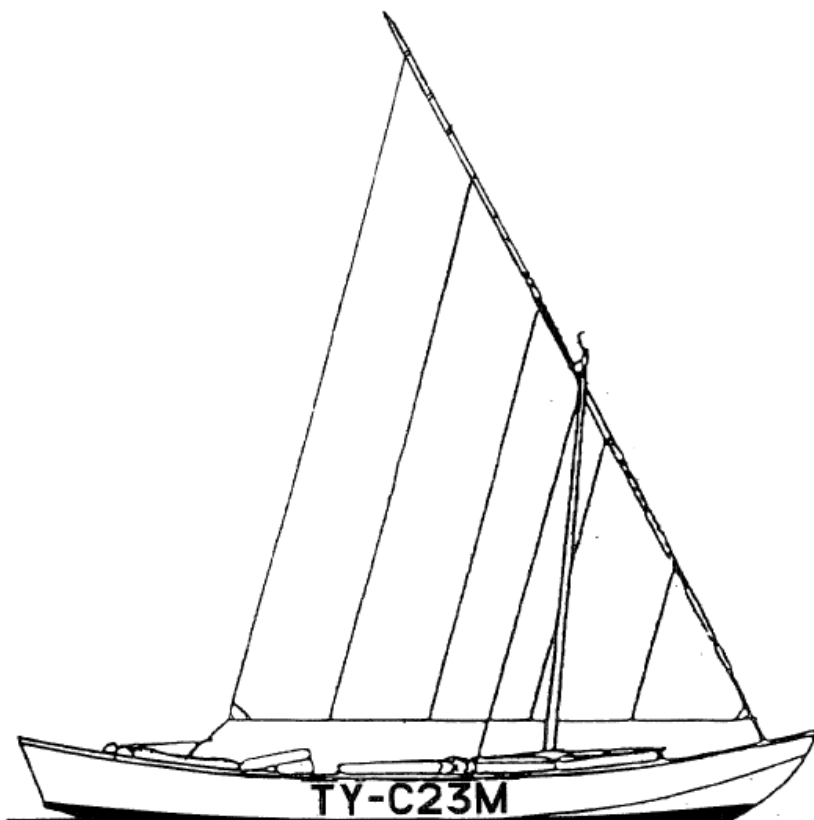
Length over all: 7.4 m
Call sign: BENIN + No.
Letter height: 0.30 m

Groupe N° 5
BATEAU AVEC VOILE

Longueur hors tout: 7,4 m
Indicatif d'appel: BENIN +
N°
Hauteur des lettres: 0,30 m

Grupo N° 5
BARCO CON VELA

Eslora máxima: 7,4 m
Distintivos de llamado: BENIN +
N°
Altura de letra: 0,30 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 5
HANDLINER

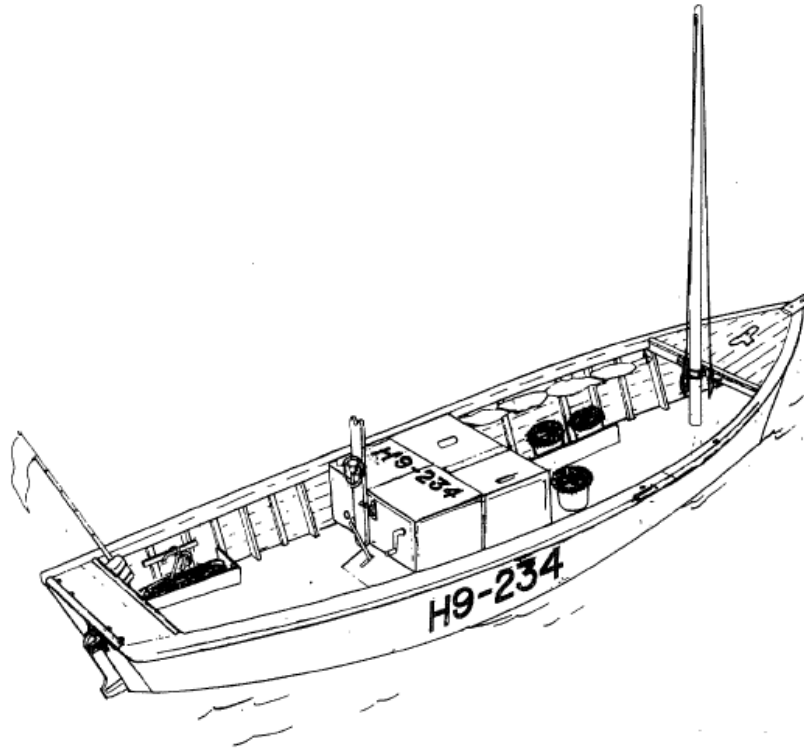
Length over all: 7.60 m
Call sign: PANAMA + No.
Letter height: 0.3 m
- on engine box: 0.10 m

Groupe N° 5
LIGNEUR A LIGNES A MAIN

Longueur hors tout: 7,60 m
Indicatif d'appel: PANAMA +
N°
Hauteur des lettres: 0,3 m
- sur coffe du moteur:
0,10 m

Grupo N° 5
EMBARCACION PARA LA PESCA CON
LINEAS DE MANO

Eslora máxima: 7,60 m
Distintivos de llamado: PANAMA
+ N°
Altura de letra: 0,3 m
- sobre alojamiento del motor:
0,10 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 5
SMALL POT FISHING VESSEL

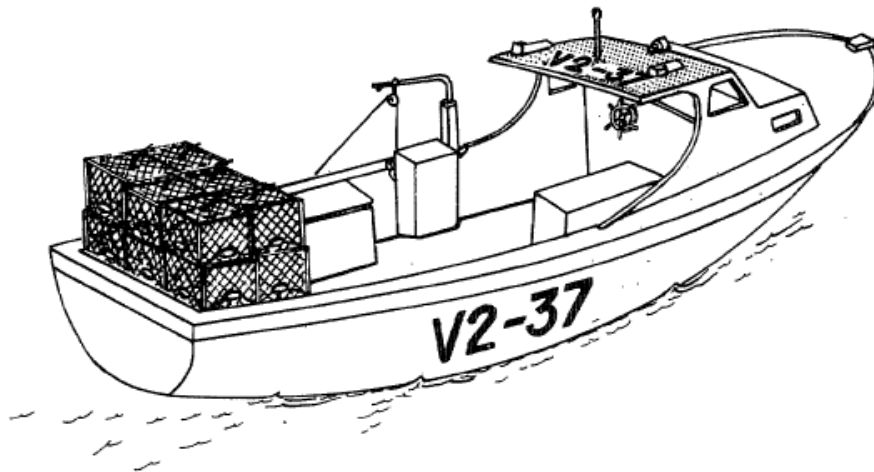
Length over all: 6 m
Call sign: ANTIGUA
Letter height: 0.3 m
- on the cuddy: 0.10 m

Groupe N° 5
CASEYEUR DE PETITE TAILLE

Longueur hors tout: 6 m
Indicatif d'appel: ANTIGUA
Hauteur des lettres: 0,3 m
- sur la tille: 0,10 m

Grupo N° 5
EMBARCACION PARA LA PESCA CON
NASAS PEQUEÑA

Eslora máxima: 6 m
Distintivos de llamado: ANTIGUA
Altura de letra: 0,3 m
- sobre la camarote de proa:
0,10 m



Annex L: CMM 2023-01 on Information Requirements for Vessel Registration

Group No. 6
OUTBOARD POWERED BOAT

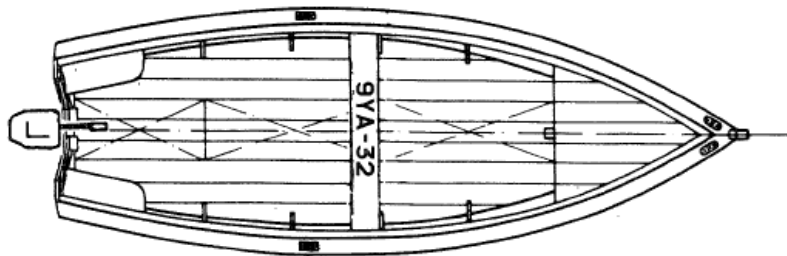
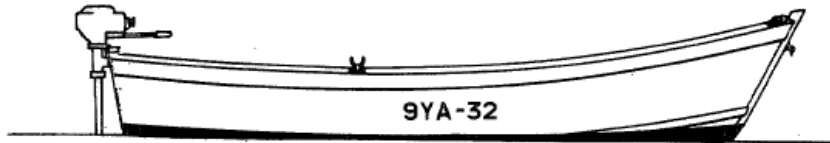
Length over all: 4.80 m
Call sign: TRINIDAD AND
TOBAGO + No.
Letter height: 0.10 m
- on seat: 0.10 m

Groupe N° 6
BATEAU A MOTEUR HORS-BORD

Longueur hors tout: 4,80 m
Indicatif d'appel: TRINITE-
ET-TOBAGO + N°
Hauteur des lettres: 0,10 m
- sur le banc: 0,10 m

Grupo N° 6
LANCHA CON MOTOR FUERA DE BORDA

Eslora máxima: 4,80 m
Distintivos de llamado:
TRINIDAD Y TABAGO + N°
Altura de letra: 0,10 m
- sobre banco: 0,10 m



NPFC IUU VESSEL LIST FOR 2023

Commission Members adopted the attached NPFC IUU List at the Sixth Commission Meeting concluded on 24 February 2023.

No.	a. Name of vessel (previous names)	b. Flag of vessel (previous flags)	c. Owner (previous owners)	d. Operator of vessel (previous operators)	e. Call sign of vessel (previous call signs)	f. Lloyds/IMO number	h. Date first included on NPFC IUU List	i. Summary of activities
1	LIAO YUAN YU 071	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°15.4'N, 153°22.8'E on 23 Aug 2016. When the Japanese patrol vessel approached, a vessel crew tried to hide the vessel name. Communication between the Japanese patrol vessel and LIAO YUAN YU 071 indicated that they hid the vessel name because they didn't want to be caught. (Port displayed on the vessel: Shidao; Vessel type; Lighted lift net vessel; Tonnage: 800t)
g. Photographs								
								

Annex M: NPFC IUU Vessel List - 2023

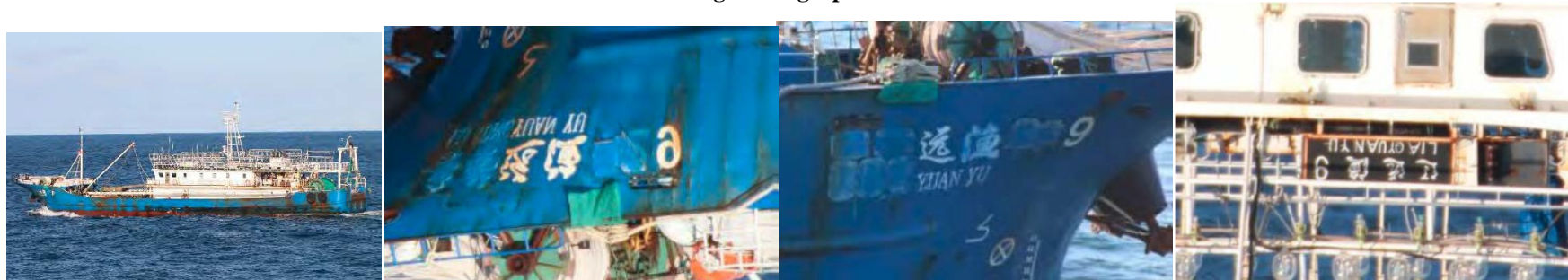
2	LIAO YUAN YU 072	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°18.7'N, 153°27.9'E on 23 Aug and at 42°9.2'N, 151°16.4'E on 11 Oct 2016. Vessel name was hidden by paint. (Port displayed on the vessel: Shidao; Vessel type; Lighted lift net vessel; Tonnage: 800t)
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g. Photographs



3	LIAO YUAN YU 9	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°3.0'N, 153°0.8'E on 23 Aug and at 42°10.0'N, 151°16.8'E on 11 Oct 2016. Vessel name was hidden by paint. (Port displayed on the vessel: Shidao; Vessel type; Lighted lift net vessel; Tonnage: 800t)
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

4	ZHOU YU 651	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°30'2N, 152°05'4E on 29 Sep 2016. (Port displayed on the vessel: Fungcheng; Vessel type; Lighted lift net vessel; Tonnage: 850t)
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g. Photographs



5	ZHOU YU 652	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°48.9'N, 152°48.2'E on 7 Sep 2016. Port of registry was hidden by paint. (Vessel type; Lighted lift net vessel; Tonnage: 820t). MMSI: 412569986
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

6	ZHOU YU 653	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	<p>It was seen with LU RONG YU YUN 56219 and ZHOU YU 656 at 42°11.9'N, 151°14.6'E on 30 Sep 2016. (Port displayed on the vessel: Fungcheng; Vessel type; Lighted lift net vessel; Tonnage: 850t)</p> <p>Communication between Japanese patrol vessel and LU RONG YU YUN 56219 indicated ZHOU YU 653 were transshipping 1500t of mackerel together with ZHOU YU 656.</p>
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

7	ZHOU YU 656	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	<p>It was seen with LU RONG YU YUN 56219 and ZHOU YU 656 at 42°11.9'N, 151°14.6'E on 30 Sep 2016. (Port displayed on the vessel: Fungcheng; Vessel type; Lighted lift net vessel; Tonnage: 850t) Note that the same vessel name with the different port of registry (Zhoushan) (600t) has been seen in the similar area.</p> <p>Communication between Japanese patrol vessel and LU RONG YU YUN 56219 indicated ZHOU YU 656 were transshipping 1500t of mackerel together with ZHOU YU 653. MMSI: 100900240 412440242</p>
g. Photographs (No Photographs Available)								

8	ZHOU YU 657	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°35.5'N, 152°6.7'E on 12 Sep 2016. (Port displayed on the vessel: Zhoushan; Vessel type; Lighted lift net vessel; Tonnage: 600t)
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g. Photographs



9	ZHOU YU 658	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 40°12.3'N, 148°40.5'E on 29 May 2016 and at 42°46.7'N, 152°41.2'E on 7 Sep 2016. (Port displayed on the vessel: Zhoushan; Vesseltype; Lighted lift net vessel; Tonnage: 600t)
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

10	ZHOU YU 659	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen in the NPFC area on 2, 4, 13, 17 Jun and 7 Sep 2016. On 4 Jun the vessel name on the right side was hidden by paint. (Port displayed on the vessel: Zhoushan; Vessel type: Lighted lift net vessel; Tonnage: 600t)
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

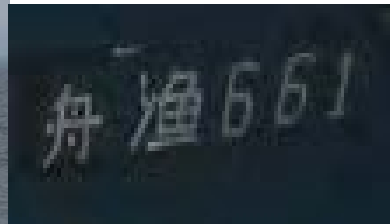
11	ZHOU YU 660	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen in the Japanese EEZ on 10 May 2016 and in NPFC area multiple times from May to Sep 2016. On 10 May the vessel showed Korean flag but changed the Korean to Japanese flag when the Japanese patrol vessel approached. Vessel name changed between 15 May and 12 Sep 2016 (see the photos). The vessel is not permitted in Japan nor registered in NPFC. (Port displayed on the vessel: Basuo-not apparent; Vessel type: Lightedlift net vessel; Tonnage: 600t)
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g. Photographs



12	ZHOU YU 661	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen in the Japanese EEZ on 10 and 13 May 2016 and in NPFC area on 15, 29 May and 7 Sep 2016. The vessel names on the left and right side changed frequently (see the photos). The vessel showed Japanese flag in May. But the vessel is not permitted in Japan nor registered in NPFC. (Port displayed on the vessel: Shidao; Vessel type: Lighted lift net vessel; Tonnage: 600t)
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g. Photographs



13	HAI DA 705	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	Communications between Japanese Patrol vessel and HAI DA705 at 43°10.4'N, 153°38.6'E on 11 Sep 2016 indicated they caught squid with drift net in the high sea. (Port displayed on the vessel: 沈家们; Vessel type: Drift net vessel; Tonnage: 290t)
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

14	LU RONG YU 1189	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 41°24.9'N, 140°32.7'E (Japan EEZ) on 14 Jun 2016. (Port displayed on the vessel: Shidao; Vessel type: Carrier vessel; Tonnage: 100t) MMSI: 412321992
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g. Photographs



15	ZHE LING YU LENG 90055	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 40°25.3'N, 149°13.2'E on 29 May 2016. (Port displayed on the vessel: Wenling; Vessel type: Carrier vessel; Tonnage: 600t) MMSI: 412000000 413202046
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

16	ZHE LING YU LENG 905	Unknown	Not known	Not known	Not known	Not known	29 Aug. 2017	It was seen at 42°45.6'N, 152°45.8'E on 24 Aug 2016. (Port displayed on the vessel: Wenling; Vessel type: Carrier vessel; Tonnage: 1000t) MMSI: 412000000 412000256
g. Photographs (No Photographs Available)								

17	LU RONG YUAN YU 101	unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	While LU RONG YUAN YU 101 is registered as a light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 101 with lift net type was seen at 49°9.2'N, 149°19.5'E on 17 May 2016. LU RONG YUAN YU 101 with stern-trawl type was seen at 38°0.2'N, 145°58.5'E on 20 May 2016. (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 800t/651t) MMSI: Lift Netter 656558842 Trawler 412328753
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

18	LU RONG YUAN YU 102	unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	<p>While LU RONG YUAN YU 102 is registered as one light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 102 with lift net type was seen at 42°21.3'N, 151°55.5'E on 11 Oct 2016. LU RONG YUAN YU 102 with stern-trawl type was seen at 42°7.3'N, 151°13.8'E on the same day. LU RONG YUAN YU 102 was also seen with a carrier vessel “MIN FU DING YU LENG 08888” at 42°22.2'N, 151°19.6'E on 12 Oct 2016. (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 800t/651t) MMSI: Trawler 412328752; Lift Net 413228752</p>
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g. Photographs



19	LU RONG YUAN YU 103	unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	While LU RONG YUAN YU 103 is registered as one light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 103 with lift net type was seen at 40°25.9'N, 150°9.9'E on 1 June 2016. LU RONG YUAN YU 103 with stern-trawl type was seen at 37°59.9'N, 145°58.5'E on 20 May 2016. (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 651t/651t) MMSI: Lift Net & Trawler 412328751
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g. Photographs



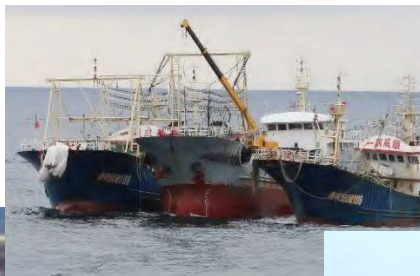
20	LU RONG YUAN YU 105	unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	While LU RONG YUAN YU 105 is registered as one light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 105 with lift net type was seen at 42°27'N, 152° 5.8'E on 11 Oct 2016. LU RONG YUAN YU 105 with stern-trawl type was seen at 41°54.8'N, 151°17.4'E on 5 Sep 2016. (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 651t/651t) MMSI: Lift Netter 926001560 412428757 Trawler 412328749
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g. Photographs



21	LU RONG YUAN YU 106	Unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	<p>While LU RONG YUAN YU 106 is registered as one light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 106 with lift net type was seen at 40°30.4'N, 149°34'E on 29 May 2016. LU RONG YUAN YU 106 with stern-trawl type was seen at 40°17.6'N, 148°33'E on the same day. The two fishing vessels with duplicate names "LU RONG YUAN YU 106" were seen transshipping with a carrier vessel "MIN FU DING YU LENG 08888" at 42°16.4'N, 151°21.4'E on 8 Oct 2016 (see the last photo). (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 651t/651t) MMSI: Lift Netter 412328748 Trawler 412328748</p>
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g. Photographs



22	LU RONG YUAN YU 108	Unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	<p>While LU RONG YUAN YU 108 is registered as one light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 108 with lift net type was seen at 40°28.4'N, 149°28.1'E on 29 May 2016. LU RONG YUAN YU 108 with stern-trawl type was seen at 40°18.6'N, 148°30.7'E on the same day. (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 651t/651t) MMSI: Trawler 800024754 Lift Netter 412443265 412328746 800025754</p>
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g. Photographs



23	LU RONG YUAN YU 109	Unknown	Not known	Not known	Not known	Not known	13 Nov. 2017	<p>While LU RONG YUAN YU 109 is registered as one light PS vessel in the NPFC list, the identical name with different vessel types were seen. LU RONG YUAN YU 109 with lift net type was seen at 40°25.1'N, 149°25 'E on 29 May 2016. LU RONG YUAN YU 109 with stern-trawl type was seen at 40°16.4'N, 148°32.1'E on the same day. (Port displayed on the vessel: Shidao; Vessel type: Stern Trawl/Light lift net vessel; Tonnage: 651t/651t) MMSI: Trawler 412328745 800025747 Lift Netter 412328745</p>
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g. Photographs



24.	LU RONG●YU 612	Unknown	Not known	Not known	Not known	Not known	19 Aug 2018	<p>A Japanese patrol vessel sighted this fishing vessel was drifting in the Convention area at 39°50.00'N, 147°1.8'E on July 21.</p> <p>The port of registry is Shidao and AIS information showed that the vessel name is “Lu Long Yuan Yu 108”, which is on the current IUU vessel list and is different from the name shown on the vessel side, and that MMSI is 412328746.</p> <p>The tonnage 651 t was derived from the information of “Lu Long Yuan Yu 108” in the current IUU vessel list.</p> <p>Ref: NPFC-2018-TCC03-WP04</p>
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

25.	LU RONG YUAN YU 787	Unknown	Not known	Not known	Not known	Not known	19 Aug 2018	A Japanese patrol vessel sighted this fishing vessel was drifting in the Convention area at 39°49.7'N, 147°2.8'E on July 21 2017, and Japanese patrol aircraft sighted the same vessel anchored at 41°3.3'N, 150°22.1'E on August 2 2017. The China flag was raised and the sign of "CHINA" was painted on the vessel side (see the photos). MMSI is 413800814 and the port of registry is Shidao. Ref: NPFC-2018-TCC03-WP04
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g. Photographs



26.	LU RONG YUAN YU YUN 958	Unknown	Not known	Not known	Not known	Not known	19 Aug 2018	A Japanese patrol fishing vessel sighted this fishing vessel was drifting in the Convention area at 39°50.9'N, 147°4.3'E on July 21. The vessel raised China flag and the port of registry was Shidao. AIS information showed that the vessel name is 958 and MMSI is 412452812. Ref: NPFC-2018-TCC03-WP04
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g. Photographs



27.	LU RONG YUAN YU 797	Unknown	Not known	Not known	Not known	Not known	19 Aug 2018	A Japanese patrol aircraft sighted this fishing vessel in the Convention area was operating at 42°7.1'N, 151°40.9'E on July 7 2017. China flag was raised and "CHINA" was painted on the vessel side (see the photo). MMSI is 412327980. Ref: NPFC-2018-TCC03-WP04
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g. Photographs



28	LU RONG SHUI 158 (鲁荣水158)	Unknown	Not known	Not known	Not known	Not known		CMM 2017-02 para 3. a	A Japanese patrol vessel sighted this fishing vessel in the Convention area at 39°59.2'N, 147°39.7'E on July 7, 2018. There is no vessel registration of this vessel on the NPFC vessel register. MMSI 412688540
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

29	Unknown(*)	Unknown – raised flag of China	Not known	Not known	Not known	Not known		CMM 2017-02 para 3. a	A Japanese trawl vessel sighted this fishing vessel indicating its vessel name “ZHOU YU 808” MMSI 412671880, in the Koko seamount area of Convention area at 36°44'N, 171°27'E on August 29, 2018, allegedly conducted fishing for deep sea coral. There was a duly registered vessel with the same name “ZHOU YU 808” on the NPFC vessel registry, but it is confirmed that the sighted vessel is not the duly licensed one.
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g. Photographs



Associated Documents

Circular 030-2018 (<https://www.npfc.int/system/files/2018-11/Circular%20030-2018%20Sighting%20Information%20of%20Fishing%20Vessels%20without%20Nationality.pdf>)
 Japanese Document (<https://www.npfc.int/system/files/2018-11/Sighting%20infomation%20from%20Japan.pdf>)

(*) This vessel indicated its name as “ Zhou Yu 808 (舟漁 808)” when sighted.

Annex M: NPFC IUU Vessel List - 2023

30	Unknown (*)	Unknown – raised flag of China	Not known	Not known	Not known	Not known		CMM 2017-02 para 3. a	A Japanese trawl vessel sighted this fishing vessel indicating its vessel name “ZHOU YU 809” MMSI 412401260, in the Koko seamount area of Convention area at 36°44'N, 171°27'E on August 29, 2018, allegedly conducted fishing for deep sea coral. There was a duly registered vessel with the same name “ZHOU YU 809” on the NPFC vessel registry, but it is confirmed that the sighted vessel is not the duly licensed one.
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g. Photographs



Associated Documents

Circular 030-2018 (<https://www.npfc.int/system/files/2018-11/Circular%20030-2018%20Sighting%20Information%20of%20Fishing%20Vessels%20without%20Nationality.pdf>)
 Japanese Document (<https://www.npfc.int/system/files/2018-11/Sighting%20infomation%20from%20Japan.pdf>)

(*) This vessel indicated its name as “ZHOU YU 809 (舟漁809)” when sighted.

31	YUANDA 6 (Assumed from MMSI number)	Unknown – raised flag of China	Not known	Not known	Not known	Not known		CMM 2017-02 para 3. a	A Japanese patrol vessel sighted this vessel conducting fishing operation in the Convention area at 25°45'9N, 147°07'06E on April 15, 2019. This nameless vessel (assumed “YUANDA6” from the vessel’s NMSI) was operating and running away when the Japanese patrol vessel approached.
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g. Photographs



32	YUANDA 8 (Assumed from MMSI number)	Unknown – raised flag of China	Not known	Not known	Not known	Not known		CMM 2017-02 para 3. a	A Japanese patrol vessel sighted this fishing vessel conducting fishing operation in the Convention area at 25°46'02N, 147°07'08E on April 15, 2019. This nameless vessel (assumed “YUANDA8” from the vessel’s NMSI) was operating and running away when the Japanese patrol vessel approached .
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g. Photographs



33	ZHEXIANG YU 23029	Unknown – raised flag of China	Not known	Not known	Not known	Not known		CMM 2017-02 para 3. a	A Japanese patrol vessel sighted this fishing vessel in the Convention area at 25°42'03N, 147°11'02E on April 15, 2019. This vessel apparently had just finished as the gear was wet. the vessel name, which was not registered on the NPFC vessel registry, was erased deliberately.
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

34	Unknown	No Nationality						CMM2019-01(para5)	A Japanese patrol vessel sighted this fishing vessel displaying the name LU RONGYUAN YU 581 鲁荣远渔 581 in the Convention area at 41°11.6'N, 174°17.7'W on July 15, 2020. This vessel was fishing under the name of a legally authorized vessels which was not in the Convention Area, consequently this vessel was conducting IUU fishing and did not display an IRCS.
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g. Photographs - Photos taken at 10:15 on July 15, 2020



Annex M: NPFC IUU Vessel List - 2023

35	Unknown	No Nationality					CMM2019-01(para5)	<p>A Japanese patrol vessel sighted this fishing vessel displaying the name LU RONG YUAN YU 582 鲁荣远渔 582 in the Convention area at 41°11.4'N, 174°22.9'W on July 15, 2020.</p> <p>This vessel was fishing under the name of a legally authorized vessels which was not in the Convention Area, consequently this vessel was conducting IUU fishing and did not display an IRCS.</p>
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g. Photographs - Photos taken at 10:46 on July 15, 2020



Annex M: NPFC IUU Vessel List - 2023

36	Unknown	No Nationality						CMM2019-01(para5)	<p>A Japanese patrol vessel sighted this fishing vessel displaying the name LU RONG YUAN YU 197 鲁荣远渔 197 in the Convention area at 41°11.3'N, 174°20.3'W on July 15, 2020.</p> <p>This vessel was fishing under the name of a legally authorized vessels which was not in the Convention Area, consequently this vessel was conducting IUU fishing and did not display an IRCS.</p>
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g. Photographs - Photos taken at 11:14 on July 15, 2020



Annex M: NPFC IUU Vessel List - 2023

37.	ZHONG FU HAO 111 (Vessel type: Carrier, previously HUMBOLDY BAY)	(Panama) (Liberia)	FUWANTONG OCEAN SHIPPING CO., LIMITED..	Ke Benwen	HO4706	8907888		CMM2021-01 (para1,2,3,6,9, 10) CMM2019-02 (para3)	This vessel was observed conducting unauthorized transshipment activities in the NPFC Convention Area on September 6, 2021.
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g. Photographs

Photos taken at 7:43 (JST) on September 6, 2021



Annex M: NPFC IUU Vessel List - 2023

38.	GLORIWAVE	(Sierra Leone)			T8A4017	9017666		CMM2021-01(para1,2,3,6,9,10), CMM2019-02(para3)	<p>This vessel was observed conducting unauthorized bunkering activities in the NPFC Convention Area on June 26, 2022.</p> <p>NOTE: TCC06 was informed that the vessel is understood to have flagged to Palau, and later Togo, and may also be using the name RIWA.</p>
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g. Photographs



Annex M: NPFC IUU Vessel List - 2023

39.	QIAN YUAN	Panama	GINSIL HOLDING GROUP LIMITED	PHAM HONG NAM	H3YK (5VEZ8)	8819691	<p>JAPAN: CMM2021-01(para1,2,3,6,9,10), CMM2019-02(para3), CMM2021-09(para38)</p> <p>PANAMA: As per Annex A, items i and j</p>	This vessel was observed conducting unauthorized transshipment activities in the NPFC Convention Area between June 23 and 26, 2022.
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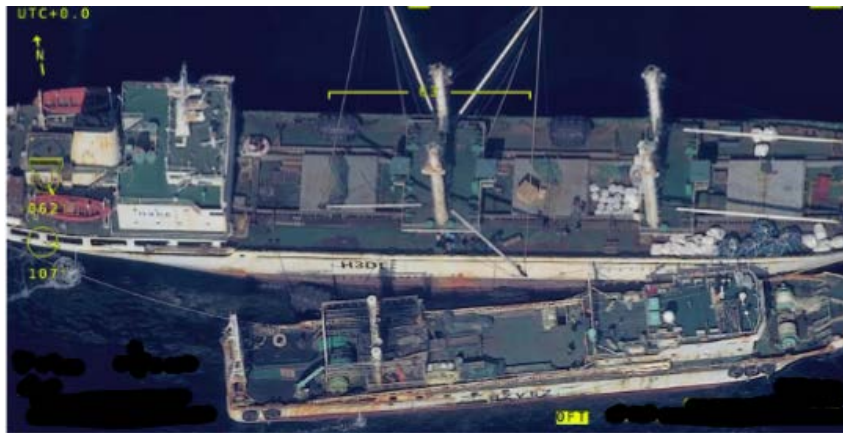
g. Photographs



Annex M: NPFC IUU Vessel List - 2023

40.	SHUN HANG (VILA MOOSUN)		(Panama) (Tuvalu)	SHUNHANG INTERNATIO NAL SHIPPING CO.,LIMITED	HOWLA DER MD NAJIR	H3DE	8214645		CMM2021-12 (para7)	This vessel was observed actively engaged in transshipment activities in the Convention Area on September 17th and a review showed it had not transmitted required VMS positional data to the NPFC Secretariat between September 16th and September 21st, 2022.
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g. Photographs



CMM 2023-13
(Entered into force dd mm 2023)

**CONSERVATION AND MANAGEMENT MEASURE FOR
THE COMPLIANCE MONITORING SCHEME**

The North Pacific Fisheries Commission (NPFC),

Acknowledging the importance of compliance by Members and Cooperating Non-Contracting Parties to achieve the objective of the Convention as defined in Article 2;

Recognizing that Article 7 of the Convention calls for the Commission to establish procedures for reviewing compliance with the Convention and measures adopted pursuant to the Convention;

Recalling that the Commission has adopted a wide range of conservation and management measures to give effect to the objective of the Convention;

Noting that, in accordance with Article 17 of the Convention, Members of the Commission have undertaken to enforce the provisions of the Convention and any conservation and management measures adopted by the Commission;

Noting also that, in accordance with international law, Members and Cooperating Non-Contracting Parties have responsibilities to effectively exercise jurisdiction and control over their flagged vessels and with respect to their nationals;

Acknowledging that Article 13 of the Convention obliges Members of the Commission to take the necessary measures to ensure that fishing vessels flying their flag comply with the provisions of the Convention and the conservation and management measures adopted pursuant thereto;

Recognizing the responsibility of Members and Cooperating Non-Contracting Parties to fully and effectively implement the provisions of the Convention and the conservation and management measures adopted by the Commission, and the need to improve such implementation and ensure compliance with these commitments;

Adopts the following conservation and management measure in accordance with Article 7 of the Convention:

I. Purpose

1. The purpose of the NPFC Compliance Monitoring Scheme (CMS) is to ensure that

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

Members and Cooperating Non-Contracting Parties (CNCs) implement and comply with obligations under the Convention and conservation and management measures (CMMs) adopted by the Commission. The purpose of the CMS is also to assess Members' and CNCs' actions in relation to alleged violations by their flagged vessels or nationals, not to assess compliance by individual vessels or persons.

2. The CMS is designed to:
 - a) Identify non-compliance by Members and CNCs with their obligations under the Convention and CMMs;
 - b) Identify areas in which technical assistance or capacity building may be needed to assist Members or CNCs to attain compliance;
 - c) Identify trends in compliance, including aspects of CMMs which may require amendment for effective implementation;
 - d) Determine responses to non-compliance by Members or CNCs; and,
 - e) Monitor and verify corrective actions taken by a Member or CNC to resolve outstanding instances of non-compliance.

II. Scope and Application

3. The Commission, with the assistance of the Technical and Compliance Committee (TCC), shall assess Members' and CNCs' compliance with the obligations arising under the Convention and the CMMs adopted by the Commission and identify trends in and instances of non-compliance.
4. For obligations relating to fishing activities, unless otherwise specified in the relevant CMM, the compliance assessment shall apply to those activities occurring in the Convention area.
5. The CMS shall not prejudice the rights, jurisdiction and duties of any Member or CNC to enforce its domestic laws or to take more stringent measures in accordance with its domestic laws, consistent with that Member's or CNC's international obligations.
6. The compliance assessment period shall be the previous calendar year.
7. The Commission, with the assistance of TCC, shall determine responses to non-compliance in accordance with Annex I.

III. Draft Compliance Report

8. Prior to TCC, the Secretariat shall compile information received from Members and CNCs including through their Annual Reports, any data collections of the Commission (e.g., reports from observers, Vessel Monitoring Systems, High Seas Boarding and Inspections, high seas transshipments), and, where appropriate, any other relevant information relating

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

to the performance of NPFC CMMs available to the Secretariat, and shall prepare a Draft Compliance Report. The Draft Compliance Report shall:

- a) Present all available information relating to each Member's or CNCP's implementation of each obligation arising from the Convention or CMMs;
 - b) Report on any compliance issues that were identified from the previous year's Final Compliance Report (i.e., Resolved Non-Compliance, Non-Compliant, or Flag State Investigation) and any corrective actions reported by the Member or CNCP; and,
 - c) Identify the potential areas of non-compliance for each Member and CNCP and, as appropriate, request any follow-up information relating to the previous year's compliance issues.
9. No later than 60 days before the TCC meeting, the Secretariat shall provide each Member and CNCP its section of the Draft Compliance Report.
10. No later than 35 days before the TCC meeting, each Member and CNCP shall provide additional information on its section of the Draft Compliance Report to the Secretariat. This information shall, as appropriate:
- a) Provide information, clarifications, amendments, or corrections necessary to address the potential compliance issues identified or respond to any request for additional information;
 - b) Propose future corrective actions to be taken, along with time frames, to come into compliance;
 - c) Identify any causes of the potential compliance issues or mitigating circumstances; and,
 - d) Identify any technical assistance or capacity building needed.
11. The Secretariat shall compile a revised Draft Compliance Report containing all information provided pursuant to paragraph 10 above.
12. No later than 15 days before TCC, the Secretariat shall circulate the revised Draft Compliance Report to Members and CNCPs and make it available on the non-public section of the Commission website. For instances of non-compliance identified in Annex II as having an associated automatic response, the Secretariat shall automatically assign the appropriate status and response. Members and CNCPs may request review of automatically assigned statuses and responses when the Draft Compliance Report is considered by TCC.
- ### **IV. Provisional Compliance Report**
13. TCC shall consider the Draft Compliance Report and any additional, readily verifiable information provided by Members, CNCPs, and the Commission, and, where appropriate, by non-governmental organizations or other organizations concerned with matters relevant to the implementation of the Convention.

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14. TCC shall develop a Provisional Compliance Report, which shall include a compliance assessment for each Member or CNCP obligation and identify response(s) to non-compliance, in accordance with Annex I. For an issue of non-compliance assigned an automatic response in accordance Annex II, TCC may consider additional responses as warranted, consistent with Annex I.
15. Each compliance assessment shall be decided by consensus. If consensus cannot be reached, the Provisional Compliance Report shall indicate majority and minority views. A Member or CNCP may not block agreement on its own compliance assessment.
16. The Provisional Compliance Report shall also include an Executive Summary with recommendations regarding, as appropriate:
 - a) Proposals to address compliance trends, and amend or improve existing CMMs;
 - b) Identified obstacles to implementation, including recommendations for capacity building assistance; and,
 - c) Revisions to the obligations to be assessed identified in Annex II.
17. TCC shall forward the Provisional Compliance Report to the Commission for consideration at the annual meeting.

V. Final Compliance Report

18. The Commission shall consider the Provisional Compliance Report recommended by TCC and adopt a Final Compliance Report.
19. The Final Compliance Report shall include:
 - a) A final compliance status for each Member and CNCP against each assessed obligation;
 - b) All responses to be taken to address instances of non-compliance; and,
 - c) An Executive Summary addressing the issues listed in paragraph 16.
20. Within 30 days following the adoption of the Final Compliance Report, the Chair of the Commission shall send a Letter of Concern to each Member or CNCP assessed a status of Non-Compliant. Such letters shall describe the relevant compliance issue(s) and the required response(s) identified in the Final Compliance Report.

VI. Data Protection

21. The Draft and Provisional Compliance Reports, and all associated documentation, shall constitute non-public domain data, but the Final Compliance Report and the executive summary shall be public domain data.

VII. Identification of Compliance Measures to be Assessed

22. Annex II includes the list of obligations to be assessed as part of the CMS. Annex II will be reviewed annually and may be amended, as appropriate, taking into account factors such as:
- a) The needs and priorities of the Commission;
 - b) Evidence of high percentages of non-compliance or repeated non-compliance with a particular obligation;
 - c) The risks posed by non-compliance to achievement of the objectives of the Convention; and,
 - d) Whether sufficient verifiable information is available to determine compliance.

VIII. Review of this Conservation Measure

23. This conservation and management measure shall expire at the conclusion of COM 08.
24. Prior to expiration, the Commission should consider adopting a lasting compliance monitoring scheme.

ANNEXES

- Annex I – Compliance Status Table
- Annex II – Obligations to be Assessed

Compliance Status Table

Compliance Status	Criteria	Potential Responses
Compliant	Member or CNCP fully compliant with obligation	None
Delayed Submission	Member or CNCP rectified non-compliance for a missed report deadline in advance of TCC and it is not a repeated case of non-compliance	Member or CNCP to include in its Annual Report all actions taken
Non-Compliant	Non-compliance with obligation identified in Annex II that does not meet the criteria of Delayed Submission or Flag State Investigation	1) Member or CNCP to rectify non-compliance and include in its Annual Report all actions taken, 2) Application of automatic response, as applicable (Annex II), and 3) Consideration of further responses.
Not Assessed	Ambiguity of relevant obligation	Review and potentially amend relevant provision(s)
Flag State Investigation	Currently undergoing investigation	1) Review by TCC and Commission and deadline(s) placed on Member or CNCP to provide further information to the Secretariat and/or take action(s), and 2) Member or CNCP to report progress in its Annual Report

Obligations to be Assessed

Obligation No.	Paragraph to be Assessed	OBLIGATION
CMM 2023-01		
INFORMATION REQUIREMENTS FOR VESSEL REGISTRATION		
For the purpose of the effective implementation of the Convention, each Commission member or Cooperating non-Contracting Party shall:		
1	2	Update pertinent information required from paragraph 1 in the NPFC Vessel Registry established under Article 13, paragraph 10 of the Convention, noting that vessel submissions which do not include the initial data elements as indicated in the Annex will not be accepted by the database.
2	3	Promptly update the NPFC Vessel Registry with: (a) any additions to the record; e.g., new vessel authorizations; (b) any modifications to this information with dates of such modifications; and (c) any deletions from the record, specifying which of the following reasons is applicable: (i) the voluntary relinquishment of the fishing by the fishing vessel owner or operator; (ii) the withdrawal or non-renewal of the Article 13 paragraph 2 of the Convention; (iii) the fact that the fishing vessel concerned is no longer entitled to fly its flag; (iv) the scrapping, decommissioning or loss of the fishing vessel concerned; or (v) any other grounds, with a specific explanation provided.
3	4	Provide to the Commission, as part of the annual report required pursuant to Article 16 of the Convention, the names of the fishing vessels entered in the record that conducted fishing activities during the previous calendar year.
4	5	Each Commission Member and Cooperating non Contracting Party shall ensure that every fishing vessel authorized to fly its flag bear markings that are readily identified in accordance with the <i>FAO Standard Specifications for the Marking and Identification of Fishing Vessels</i> , and recognize that non-compliance with these standards shall be considered a serious violation according to Article 17, paragraph 5 of the NPFC Convention and Article 21 Paragraph 11(f) of the United Nations Fish Stocks Agreement.
5	6	Commission Members and Cooperating non-Contracting Parties shall ensure they have maintained the NPFC Vessel Registry of the vessels based on the information provided to it and make the record publicly available as appropriate and subject to any legal confidentiality regulations of the individual Commission member and Cooperating non-Contracting Party.

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Obligation No.	Paragraph to be Assessed	OBLIGATION
6	7	<p>The Commission member or Cooperating non-Contracting Parties entering vessels identified in paragraph 2 on the NPFC Vessel Registry established under paragraph 1 shall attest that the vessel or vessels being added recommended are not vessels:</p> <p>(a) with a history of illegal, unreported or unregulated (IUU) fishing, unless the ownership of the vessel has subsequently changed and the new owner has provided sufficient evidence demonstrating that the previous owner or operator has no legal, beneficial or financial interest in, or control of the vessels, or Commission members or Cooperating non-Contracting Parties concerned is satisfied that, having taken into account all relevant facts, the vessel is no longer engaged in or associated with IUU fishing; or</p> <p>(b) that are currently listed on any of the IUU vessel lists adopted by regional fishery management organizations (RFMOs)</p>
<p>CMM 2019-02</p> <p>TO ESTABLISH A LIST OF VESSELS PRESUMED TO HAVE CARRIED OUT ILLEGAL, UNREPORTED AND UNREGULATED ACTIVITIES IN THE CONVENTION AREA</p>		
<p>24. Members/CNCPs shall take all necessary non-discriminatory measures under their applicable legislation, international law and each Members/CNCPs' international obligations, and pursuant to paras 56 and 66 of the IPOA-IUU to:</p>		
7	24(a)	remove or withdraw vessels on the NPFC IUU Vessel List from the NPFC Vessel Registry;
8	24(e)	Refuse to grant their flag to vessels on the NPFC IUU Vessel List, unless the ownership of the vessel has subsequently changed and the new owner has provided sufficient evidence demonstrating that the previous owner has no legal, beneficial or financial interest in, or control of the vessels, or the member concerned is satisfied that that, having taken into account all relevant facts, the vessel is no longer engaged in or associated with IUU fishing activities.
<p>CMM 2023-09</p> <p>HIGH SEAS BOARDING AND INSPECTION PROCEDURES</p>		
9	07	Each Member of the Commission shall ensure that vessels flying its flag accept boarding and inspection by authorized inspectors in accordance with these procedures. Such authorized inspectors shall comply with these procedures in the conduct of any such activities.
<p>14. Each Contracting Party that intends to carry out boarding and inspection activities pursuant to these procedures shall so notify the Commission, through the Executive Secretary, and shall provide the following:</p>		
10	14(a)	<p>with respect to each inspection vessel it assigns to boarding and inspection activities under these procedures:</p> <p>i) details of the vessel (name, description, photograph, registration number, port of registry (and, if different from the</p>

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

Obligation No.	Paragraph to be Assessed	OBLIGATION
		<p>port of registry, port marked on the vessel hull), international radio call sign and communication capability);</p> <ul style="list-style-type: none"> ii) An example of the credentials issued to the inspectors by its authorities; iii) notification that the inspection vessel is clearly marked and identifiable as being on government service; iv) notification that the crew has received and completed training in carrying out boarding and inspection activities at sea in accordance with any standards and procedures as may be adopted by the Commission.
11	14(b)	<p>with respect to inspectors it assigns pursuant to these procedures:</p> <ul style="list-style-type: none"> i) the names of the authorities responsible for boarding and inspection; ii) notification that such authorities' inspectors are fully familiar with the fishing activities to be inspected and the provisions of the Convention and conservation and management measures in force; and iii) notification that such authorities' inspectors have received and completed training in carrying out boarding and inspection activities at sea in accordance with any standards and procedures as may be adopted by the Commission.
12	15	<p>Where military vessels are used as a platform for the conduct of boarding and inspection, the authorities of the inspection vessel shall ensure that the boarding and inspection is carried out by inspectors fully trained in fisheries enforcement procedures and duly authorized for this purpose under national laws, and that boardings from such military vessels and inspectors conform to the procedures contained within these Boarding and Inspection Procedures.</p>
13	26	<p>During the conduct of a boarding and inspection, the master of the fishing vessel shall:</p> <ul style="list-style-type: none"> a. follow internationally accepted principles of good seamanship so as to avoid risks to the safety of authorized inspection vessels and inspectors; b. accept and facilitate prompt and safe boarding by the authorized inspectors; c. be encouraged to provide a boarding ladder in accordance with Annex A; d. cooperate with and assist in the inspection of the vessel pursuant to these procedures; e. not assault, resist, intimidate, interfere with, or unduly obstruct or delay the inspectors in the performance of their duties; f. allow the inspectors to communicate with the crew of the inspection vessel, the authorities of the inspection vessel, any embarked observers, as well as with the authorities of the fishing vessel being inspected; g. provide the inspectors onboard with reasonable facilities, including, where appropriate, food and accommodation; and h. facilitate safe disembarkation by the inspectors
14	28	<p>The authorities of the fishing vessel, unless generally accepted international regulations, procedures and practices relating to safety at sea make it necessary to delay the boarding and inspection, shall direct the master to accept the boarding and inspection. If the master does not comply with such direction, the Member shall suspend the</p>

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

Obligation No.	Paragraph to be Assessed	OBLIGATION
		vessel's authorization to fish and order the vessel to return immediately to port. The Member shall immediately notify the authorities of the inspection vessel and the Commission of the action it has taken in these circumstances.
15	31	Authorized inspectors shall prepare a full report on each boarding and inspection they carry out pursuant to these procedures in accordance with a format specified by the Commission. The authorities of the inspection vessel from which the boarding and inspection was carried out shall transmit a copy of the boarding and inspection report to the authorities of the fishing vessel being inspected, as well as the Secretariat, within 3 (three) full working days of the completion of the boarding and inspection.
16	32	Such report shall include the names and authority of the inspectors and clearly identify any observed activity or condition that the authorized inspectors believe to be a violation of the Convention or conservation and management measures in force and indicate the nature of specific factual evidence of such violation.
17	41	Contracting Parties that authorize inspection vessels to operate under these procedures shall report annually to the Commission on the boarding and inspections carried out by its authorized inspection vessels, as well as upon possible violations observed.
18	42	Contracting Parties shall include in their annual statement of compliance within their Annual Report to the Commission under Article 16 of the Convention action that they have taken in response to boarding and inspections of their fishing vessels that resulted in observation of alleged violations, including any proceedings instituted and sanctions applied.
<p>CMM-2023-05</p> <p>BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE ECOSYSTEMS IN THE NORTHWESTERN PACIFIC OCEAN</p>		
<p>4. Members of the Commission shall take the following measures in order to achieve sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area:</p>		
19	4 A.	Limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
20	4 G.	A. Further, considering accumulated information regarding fishing activities in the western part of the Convention Area, in areas where, in the course of fishing operations, cold water corals more than 50Kg, or sponges more than 500 Kg are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease bottom fishing activities in that location. In such cases, the

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

Obligation No.	Paragraph to be Assessed	OBLIGATION
		<p>vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 1 nautical mile, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species, shall be reported to the Secretariat. The Executive Secretary shall, within one business day, notify the other Members of the Commission, and at the same time implement a temporary closure in the area to prohibit bottom fishing vessels from contacting the sea floor with their trawl nets. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive secretary. It is agreed that the VME indicator taxa include cold water corals: <i>Alcyonacea</i>, <i>Antipatharia</i>, <i>Gorgonacea</i>, and <i>Scleractinia</i> and the classes of <i>Hexactinellida</i>, <i>Demospongiae</i> in the phylum Porifera.</p>
21	4 K.	Limit annual catch of North Pacific armorhead to 15,000 tons for Japan.
22	5	Members of the Commission shall submit to the SC their assessments of the impacts of fishing activity on marine species or any VMEs, including the proposed management measures to prevent such impact. Such submissions shall include all relevant data and information in support of any such assessment.
<p>6. Scientific Information</p> <p>To facilitate the scientific work associated with the implementation of these measures, each Member of the Commission shall undertake:</p>		
23	6 A.	<p>A. Reporting of information for purposes of defining the footprint</p> <p>In implementing paragraphs 4A and 4B, the Members of the Commission shall provide for each year, the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, and areas fished (names of seamounts) to the Secretariat. The Secretariat shall circulate the information received to the other Members consistent with the approved Regulations for Management of Scientific Data and Information,</p>
24	6 B.	<p>Collection of information</p> <p>(i) Collection of scientific information from each bottom fishing vessel operating in the western part of the Convention Area.</p> <p>(a) Catch and effort data</p> <p>(b) Related information such as time, location, depth, temperature, etc.</p> <p>(ii) As appropriate the collection of information from research vessels operating in the western part of the Convention Area.</p>

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Obligation No.	Paragraph to be Assessed	OBLIGATION
		(a) Physical, chemical, biological, oceanographic, meteorological, etc. (b) Ecosystem surveys, (c) Seabed mapping (e.g. multibeam or other echosounder); seafloor images by drop camera, remotely operated underwater vehicle (ROV) and/or autonomous underwater vehicle (AUV). (iii) Collection of observer data Duly designated observers from the flag member shall collect information from bottom fishing vessels operating in the western part of the Convention Area. Observers shall collect data in accordance with Annex 5. Each Member of the Commission shall submit the reports to the Secretariat in accordance with Annex 4. The Secretariat shall compile this information on an annual basis and make it available to the Members of the Commission.
25	8	All vessels authorized to bottom fishing in the western part of the Convention Area shall carry an observer on board.
CMM 2023- 06 BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE ECOSYSTEMS IN THE NORTHEASTERN PACIFIC OCEAN		
26	8	The Members shall provide all available information as required by the Commission for any current or historical fishing activity by their flag vessels, including the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, areas fished (names or coordinates of seamounts), and information from scientific observer programmes (see Annexes 4 and 5) to the NPFC Secretariat as soon as possible and no later than one month prior to SC meeting. The Secretariat will make such information available to SC.
CMM 2023-07 CHUB MACKEREL		
27	1	Members of the Commission and Cooperating non-Contracting Parties (CNCs) with substantial harvest of chub mackerel in the Convention Area shall refrain from expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for chub mackerel from the historical existing level until the stock assessment by the SC has been completed.
28	6	Members of the Commission and CNCs shall provide their data on chub mackerel separated by the Convention Area and the areas under national jurisdiction adjacent to the Convention Area in accordance with the data requirements adopted by the Commission in the Annual Report by the end of February, every year. The Commission shall review such information at the annual meeting of every year.
CMM 2023-08 PACIFIC SAURY		
29	1	Members of the Commission, not described under Paragraph 2, and that are currently fishing for Pacific saury shall refrain from

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

Obligation No.	Paragraph to be Assessed	OBLIGATION
		expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for Pacific saury from the historical existing level.
30	2	Members fishing for Pacific saury in areas of their jurisdiction that are adjacent to the Convention Area <i>shall refrain from rapid expansion</i> , in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for Pacific saury from the historical existing level.
31	5	In 2023 and 2024 the annual total allowable catch (TAC) of Pacific saury in the Convention Area shall be limited to 150,000 metric tons.
32	6	As a provisional measure until the Commission decides allocation of the TAC, each Member of the Commission shall reduce the annual total catch of Pacific saury by the fishing vessels entitled to fly its flag in 203 and 2024 by 55% from its reported catch in 2018 so that the total catch in the Convention Area will not exceed the TAC set out in Paragraph 5.
33	7	To comply with the provisional measures above, Members of the Commission shall report to the Executive Secretary in the electronic format, weekly catches of Pacific saury in the Convention Area by fishing vessels flying their flags by Wednesday of the next week. The Executive Secretary shall make publicly available the compiled catch of Pacific saury in the Convention Area on the Commission’s website without delay.
34	8	In the event that a Member reaches 70% of its catch limit set out in paragraph 6, the Executive Secretary shall inform that Member of that fact, with a copy to all other Members. That Member shall close the fishery for its flagged vessels when the total catch of its flagged vessels is equivalent to 100% of its catch limit. Such Member shall notify promptly the Executive Secretary of the date of the closure, except as described in paragraph 9.
2019-10		
SABLEFISH		
35	5	Members referenced in paragraph 2 and Members fishing for Sablefish in areas of their jurisdiction that are adjacent to the eastern part of the Convention Area shall adhere to the exploratory fishing protocol as set out in Annex 1 of CMM 2019-06 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean when considering new and exploratory bottom fishing activities in the Convention Area.
36	8	All vessels authorized to fish sablefish in the eastern part of the Convention Area shall have 100% observer coverage.
CMM 2023-11		
JAPANESE SARDINE, NEON FLYING SQUID AND JAPANESE FLYING SQUID		
37	1	Members of the Commission and Cooperating non-Contracting Parties (CNCs) with substantial harvest of any of Japanese sardine, neon flying squid and Japanese flying squid (hereinafter referred to as “the three Pelagic Species”) in the Convention Area shall refrain from expansion, in the Convention Area, of the number of fishing vessels

Annex N: CMM 2023-13 For the Compliance Monitoring Scheme

Obligation No.	Paragraph to be Assessed	OBLIGATION
		entitled to fly their flags and authorized to fish for such species from the historical existing level until the stock assessment for such species by the SC has been completed.
38	6	Members of the Commission and CNCPs shall provide their data on the three Pelagic Species in accordance with the data requirements adopted by the Commission in the Annual Report by the end of February, every year. The Commission shall review such information at the annual meeting of every year.
CMM 2023-12		
VESSEL MONITORING SYSTEM		
39	8	All Members or CNCPs shall ensure that its flagged vessels that are authorized under NPFC and present in the Convention Area transmit VMS data every hour to their FMC.
40	10	Each Member or CNCP shall ensure that their FMC automatically transmits VMS data to the Secretariat, which shall be received no later than 60 minutes upon receipt of the data at their FMC.
41	11	Each Member or CNCP shall ensure that their FMC can automatically receive VMS data and transmit VMS data to the Secretariat.
42	12	Each Member or CNCP shall provide the Secretariat with VMS contact points in their FMCs including the name, position, email address and phone number of their VMS contact points. The Secretariat will make a list of VMS contact points available to all Members and Cooperating non-Contracting Parties.
43	21	If a failure to transmit occurs more than two times within a period of one year, the flag Member or CNCP of the fishing vessel shall investigate the matter, including having an authorized official examine the MTU on board the vessel. The outcome of this investigation shall be forwarded to the Secretariat within fifteen (15) days of its completion.
CMM 2023-13		
COMPLIANCE MONITORING SCHEME		
44	10	No later than 35 days before the TCC meeting, each Member and CNCP shall provide additional information on its section of the Draft Compliance Report to the Secretariat. This information shall, as appropriate: <ul style="list-style-type: none"> a) Provide information, clarifications, amendments, or corrections necessary to address the potential compliance issues identified or respond to any request for additional information; b) Propose future corrective actions to be taken, along with time frames, to come into compliance; c) Identify any causes of the potential compliance issues or mitigating circumstances; and, d) Identify any technical assistance or capacity building needed.

**5th Finance and Administration Meeting
REPORT**

21 March 2023

March 2023

This paper may be cited in the following manner:

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North Pacific Fisheries Commission
5th Meeting of the Finance and Administration Committee

17 March 2023

REPORT

Agenda Item 1. Opening of the Meeting

1. The 5th Meeting of the Finance and Administration Committee (FAC) took place as a hybrid meeting in Sapporo, Japan and via WebEx, and was attended by Members from Canada, China, European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Panama attended virtually (via WebEx) as observers.
2. Noting that a quorum was present, the FAC Chair, Mr. Dan Hull (USA) opened the meeting on 17 March 2023, and outlined procedural matters including the meeting schedule and administrative arrangements. The Chair noted that the meeting represents a return to normal procedures for NPFC and thanked the Secretariat's past and current staff for their efforts to ensure smooth operations throughout the pandemic.

Agenda Item 2. Appointment of Rapporteur

3. Dr. Shelley Clarke was appointed rapporteur for FAC05.

Agenda Item 3. Adoption of the Agenda

4. The provisional agenda, as proposed in NPFC-2023-FAC05-MIP02 and annotated in NPFC-2023-FAC05-MIP03, was adopted (**Annex A**). The List of Documents and Participants List are attached as **Annex B** and **Annex C**.

Agenda Item 4. Financial Statement

4.1 Audit Report for 2020/21 and 2021/22 Fiscal Years

5. The Executive Secretary, Dr Robert Day presented the audit reports for 2020/21 (NPFC-2023-FAC05-IP01) and 2021/22 (NPFC-2023-FAC05-IP02 rev 1) and noted their relevance to

FAC05-WP11 and the proposed changes to the management of the separate NPFC funds.

6. **Recommendation 1:** FAC05 recommended that the audit reports be adopted as presented.

4.2 *Secretariat financial update for first three quarters of 2022/2023 fiscal year (i.e. April 1- December 31, 2022)*

7. The Executive Secretary presented a financial update for the current fiscal year through 31 December 2022 (NPFC-2023-FAC05-WP01) with updates presented in a powerpoint presentation showing details to 31 March 2023 and noting a potential surplus (unaudited) of approximately ¥17,251,994.

8. **Recommendation 2:** FAC05 recommended that the financial update report be adopted as presented.

4.3 *Status of Member contributions for 2021/2022 and 2022/2023 fiscal years to December 31, 2022*

9. The Executive Secretary reported on the status of Member contributions through 31 December 2022, representing fiscal years 2021/2022 and 2022/2023 (NPFC-2023-FAC05-WP01).

10. It was noted that contributions from several Members have been delayed but are expected soon.

4.4 *Status of other funds as of 31 December 2022, (including Working Capital Fund, Voluntary Contributions Fund and the Special Project Fund)*

11. It was noted that the Working Capital Fund (WCF) is the subject of another FAC paper (NPFC-2023-FAC05-WP11) which will be dealt with under Agenda Item 8.

12. The Executive Secretary noted that Panama has committed to pay a voluntary contribution for 2022/23 as outlined in NPFC-2023-COM07-WP09 rev1 and had only recently been informed by the Secretariat of the amount.

13. The Executive Secretary clarified the difference between the Special Purposes Fund, which is specified in para. 26 of the NPFC Financial Regulations, and the Special Projects Fund, which was created to receive transfers of surplus funds from the Working Capital Fund at COM03 under para. 18.

Agenda Item 5. Secretariat's Work Plan and Budget

5.1 *Secretariat's Work Plan for 2022/23*

14. The Executive Secretary introduced NPFC-2023-FAC05-WP02 containing the Secretariat's Work Plan for 2023/24. He highlighted the continuing work supporting SC and the work of the SWG on MSE for Pacific saury, the continuing work supporting TCC and the TCC work plan, the further development of information technology systems and data products, the need to re-examine and streamline some of the Secretariat's human resources and administrative

systems, and opportunities for enhancing cooperation with related organizations and raising the profile of the NPFC with the public.

15. Members discussed the meetings proposed to be attended by Secretariat staff and noted the limited resources available to the Secretariat in terms of travel budgets and staff time.
16. **Recommendation 3:** FAC05 recommended that COM07 direct the Secretariat to employ the following general principles when prioritizing travel and human resources allocation and have the Secretariat report back to FAC06 on meeting attendance with regard to these principles:
 - (a) Priority should be given to those meetings pertaining to management of fishery resources or fishing grounds like those managed by NPFC;
 - (b) Priority should be given to attendance at annual Commission meetings rather than their subsidiary bodies, however, for the purposes of capacity building attendance at meetings of subsidiary bodies (e.g. the NPFC CM to attend the next WCPFC TCC to become familiar with regional processes and issues) should be considered;
 - (c) Virtual attendance should be considered as a means of reducing travel cost and time but noting that staff time would still need to be invested;
 - (d) Meetings may also be prioritized based on ease of access and relevance of the specific topics to be considered at each.
17. **Recommendation 4:** FAC05 recommends to COM07 that the Secretariat's Work Plan for 2023/24 be adopted as presented (**Annex D**).
18. **Recommendation 5:** FAC05 also recommends, noting the recommendation for allocation of ¥1,200,000 (US\$10,000) to hold a meeting of the Joint SC/TCC/COM Small Working Group on MSE for Pacific saury as part of the Work Plan for the SWG MSE PS, that the Secretariat ensure that the review of future proposals for use of the Special Projects Fund follows the procedures from **Annex D** of FAC01 that was adopted through para. 27 of COM03.

5.2 *Budget for 2023/2024, Budget Estimates for 2024/2025 and Indicative Budget Estimates for 2025/2026 and 2026/2027*

19. The Executive Secretary presented an overview of the budgets for 2023/24 and 2024/25 and indicative budgets for the following two fiscal years (NPFC-2023-FAC05-WP01). He noted two concurrent financial pressures - inflation and devaluation of the yen. Reference was also made to the need for several separate considerations by FAC05 of issues under Agenda Item 8 – Other Matters, that could influence the budget.
20. The Executive Secretary invited comment on the issue of staff remuneration increments, for example, increments of 1% or 2% for the next fiscal year.
21. It was noted that the staff regulations require that remuneration considerations include both the remuneration of United Nations officials working in Japan as well as government officials working in Japan.
22. **Recommendation 6.** FAC05 recommended the budget for 2023/2024, the budget estimates

for 2024/2025 and the indicative budget estimates for 2025/2026 and 2026/2027, showing the Commission's projected annual budget of ¥160,804,996 plus ¥20,000,000 for hosting Commission meetings (see Agenda Item 8.5) which will be offset by a transfer of ¥20,000,000 from the Working Capital Fund to COM07 for its consideration (**Annex E**).

23. **Recommendation 7:** FAC05 recommended the Member contributions for 2023/24 and 2024/25 as also shown in NPFC-2023-FAC05-WP01 rev 2 to COM07 for its consideration (**Annex F**).

5.3 *Consideration of Staff Remuneration Benefits Package*

24. The Chair introduced NPFC-2023-FAC05-WP05 and NPFC-2023-FAC05-WP-06 on General Service (GS) and Professional level staff remuneration benefits packages and noted that decisions on these issues could affect budget totals. Discussions on these items were conducted in closed session due to their sensitive nature regarding financial and personnel matters.

5.3.1 *GS Level*

25. **Recommendation 8:** FAC05 recommends that COM07 task the Secretariat with conducting a review of GS remuneration packages as outlined in para. 5.2 of the staff regulations, i.e. that salaries be established in line with local conditions.
26. **Recommendation 9:** FAC05 recommends that COM07 task the Secretariat to review its staffing levels, including the Data Coordinator position, in line with recommendations in the NPFC Performance Review, for review at FAC06.

5.3.2 *Professional Level including Repatriation Allowance*

27. After reviewing NPFC-2023-FAC05-WP06, FAC05 recognized the important contributions of the former Compliance Manager and considered that all commitments between the Commission and the former Compliance Manager have been fulfilled.
28. **Recommendation 10:** Noting the exceptional nature of the Commission's request to delay the timing of his repatriation, and without setting any precedent for future staff remuneration issues, FAC05 recommends the issue of compensation to be paid to the former Compliance Manager, potentially from the Working Capital Fund, be considered by COM07 Heads of Delegation.
29. **Recommendation 11:** FAC05 recommended that COM07 task the Secretariat to undertake a broad review of the associated staff remuneration issues, including the fixed exchange rate provision.

Agenda Item 6. Administration Matters

6.1 *NPFC Secondment and Internship Projects*

30. The Executive Secretary introduced paper NPFC-2023-FAC05-WP04 which describes an application to extend a secondment (Ms Natsuki Hosokawa) and a new application for an intern position (Mr Jihwan Kim). The Secretariat recommends accepting both.
31. Regarding the internship application of Mr Kim, Korea noted that their internal processes had not been duly followed, but stated that they would agree to accepting Mr Kim because the Executive Secretary recommended his application.
32. **Recommendation 12:** FAC05 recommends to COM07 that the Commission accept the application for extension of a secondment to the Secretariat by Ms Natsuki Hosokawa and the application for an internship by Mr Jihwan Kim.

6.2 *Transparency*

33. The Executive Secretary introduced paper NPFC-2023-FAC05/TCC06-WP03 which considers updates to NPFC document rules including access to documents by accredited observers. He noted that the practice had been to provide documents to accredited and registered observers only once they have arrived at the meeting.
34. Members supported the proposed changes to the NPFC document rules outlined in the paper.
35. Some Members suggested that the Commission consider steps beyond those proposed in the paper because they consider that the NPFC data rules are still too strict. These Members called for all meeting documents to be made publicly available as is the case in other RFMOs.
36. Some Members requested that the Commission consider further action to provide meeting documents in advance of the meeting, other than confidential papers, to the public.
37. **Recommendation 13:** FAC05 recommends to COM07 to endorse the amendment to the document rules, recognizing that TCC will also be reviewing this WP and making a recommendation on this issue.
38. Members also noted their interest in ensuring that the NPFC document management system be efficient and facilitate access and understanding by Members. Such actions could include:
 - (a) Avoid posting duplicate papers under multiple meetings;
 - (b) Identify when new or revised papers are posted so that Members can easily identify and retrieve any new materials;
 - (c) Consider an auto-notification function when new or revised papers are posted;
 - (d) Better organize background and historical documents for ease of reference; and
 - (e) Increase the use of circulars to keep stakeholders better informed of NPFC meetings (e.g., science meetings be circulated more broadly).

Agenda Item 7. Performance Review and Items of Relevance to FAC

39. Dr. Penelope Ridings, Chair of the NPFC Performance Review, made a brief presentation on the results of the NPFC Performance Review (NPFC-2023-FAC05-WP08) and noted specific issues for FAC.
40. She noted that the review team was comprised of 8 reviewers, including 4 internal experts who had a high level of familiarity with the workings of the NPFC. All work was done remotely using document research, a Member questionnaire and interviews of Chairs and others familiar with NPFC. As a result the team was not able to directly observe financial or administrative processes. While the performance review made a number of positive findings, it also identified certain financial and administrative issues, including the long-term sustainability of budgets and staffing levels, the utility of a corporate plan to guide the Secretariat at a strategic level and complement the annual Work Plan, and the need to work further to improve transparency.
41. Members requested clarification on one of the recommendations of the Performance Review Panel (Recommendation 8.3.1) which calls for proposals for new or revised CMMs to be accompanied by cost estimates for implementation which can form the basis for including necessary funds in the Commission's budget.
42. Dr. Ridings explained that the performance review panel anticipated that the Secretariat would provide a rough cost estimate to indicate when additional resources (e.g., database development or analytical capacity in the Secretariat) would be needed to effectively implement new measures.
43. Members also discussed the options proposed in the Secretariat's paper for responding to the findings of the performance review, with many expressing a preference for the Secretariat to coordinate a process whereby the subsidiary bodies would respond to the recommendations that are relevant to them. However, many of the same Members recognized the limited time available to the "small working groups" of subsidiary bodies to devote time to this task given their already full agendas. It was also noted that FAC did not currently have an intersessional process in place. Some Members also noted the challenges for subsidiary bodies to add this issue to their agendas, even virtually, in time to report their recommendations to COM08.
44. **Recommendation 14:** FAC05 generally supported the option of the Secretariat coordinating a process with NPFC bodies to provide feedback on the Performance Review Panel's recommendations to COM08, but deferred further details to discussions at COM07, recognizing that other subsidiary bodies will also review and provide comments.

Agenda Item 8. Other Matters

8.1 *Draft MOUs with SPFRMO, WCPFC and ISC*

45. Based on time constraints, FAC05 was not able to consider three proposed MOUs with WCPFC, SPRFMO and ISC. Current drafts of these MOUs are contained in NPFC-2023-FAC05-WP07, WP09 and WP12.
46. **Recommendation 15:** FAC05 recommended consideration of the draft MOUs with SPRFMO, WCPFC and ISC by COM07, recognizing that two of the MOUs (SPRFMO and WCPFC) are also on the TCC agenda.

8.2 *Proposed amendments to staffing and evaluation policies*

47. The Executive Secretary presented a proposal to revise the staff selection policy and individual performance review (NPFC-2023-FAC05-WP10). The Chair noted the Secretariat's paper updates two human resources-related issues.
48. In response to a question the Executive Secretary clarified that the proposed changes only applied to the selection and performance appraisal of NPFC staff other than the Executive Secretary. The proposal would place staff performance reviews directly under the purview of the Executive Secretary rather than involving the Chair and Vice-Chair of the Commission as well as Members and was highlighted in the NPFC Performance Review (para. 441-442).
49. FAC05 discussed the proposal and a revised working paper was produced (NPFC-2023-FAC05-WP10 rev1).
50. **Recommendation 16.** FAC05 supported and recommended to COM07 to consider the Secretariat's proposal (NPFC-2023-FAC05-WP10 rev1) on individual performance reviews for staff to revert to a simpler process that resides with the Executive Secretary, as suggested in the NPFC Performance Review.
51. FAC05 noted, but did not make recommendations on other aspects of NPFC-2023-FAC05-WP10 rev1 on the understanding that discussions will continue in the margins of COM07.

8.3 *Proposal to simplify the audit process through establishing dedicated bank accounts*

52. The Executive Secretary presented a proposal (NPFC-2023-FAC5-WP11) to simplify the maintenance and monitoring of NPFC funds, as well as an option related to the use of the funds currently set aside in the Working Capital Fund, including the funding of the General Fund at ¥30,000,000.
53. Members supported the creation of a general fund as an operating account, including separating pension and repatriation funds which are in need of replenishment after the retirement of the former Executive Secretary and Compliance Manager.
54. Members discussed the size of the reserve to be maintained in the Working Capital Fund with some suggesting a previous auditor's recommendation of a 6-month reserve is sufficient and others advocating smaller or larger reserves. Noting that there is as yet no decision on the amount of the cap referred to in the NPFC Financial Regulations, Members also discussed

whether the ultimately agreed reserve amount should be a floor, a target or a cap.

55. Members also raised other considerations including:

- (a) The relationship between the proposed funds and the Special Purposes Fund identified in the Financial Regulations;
- (b) Whether any changes to the Financial Regulations would be needed before re-structuring the funds as proposed;
- (c) The recognition that drawing down the Working Capital Fund can offset increasing operating expenditures in the short-term, but as that capital is reduced Member contributions may need to increase; and
- (d) If a Working Capital Fund draw-down is made, the desirability of using draw-downs gradually over multiple years in a way that can mitigate increases in annual Member contributions but also avoid year-to-year fluctuations that might create difficulties for national budgeting.

56. **Recommendation 17.** FAC05 recommends to COM07 that the Secretariat establish a General Fund (Financial Regulations 20.b) with a balance of ¥30,000,000 as of 1 April 2023 to serve as an operating fund for the Commission, separate from the Working Capital Fund which would more clearly serve as a contingency fund.

57. **Recommendation 18.** FAC05 recommends to COM07 that the Secretariat establish separate funds and accounts for pension and repatriation funds as outlined in WP11, consistent with the NPFC Financial Regulations.

8.4 *Consideration of a Consultancy for a Legal Advisor*

58. The Executive Secretary explained that hiring of a legal advisor for the NPFC seems to have been agreed in 2018 but was never implemented. Instead, short-term contracts have proceeded intermittently on a case by case basis (NPFC-2023-FAC05-WP13).

59. Some Members expressed doubts about the need to retain a legal advisor and how to address issues such as whether this independent advice might contradict advice from their domestic legal advisors. Questions also were raised as to how a legal advisor would be selected, how their advice would be actioned and whether the cost could be justified.

60. Other Members recognized that legal advice can be helpful in understanding complex issues but noted that such issues could be handled through contracting for legal advice as and when the need arises, thereby reducing costs.

61. **Recommendation 19.** FAC05 recommends to COM07 that the Secretariat make use, as needed, of short-term contracts for Commission-related oceans law advice and implications for the Secretariat until the need for a longer-term consultancy is more clearly identified.

8.5 *Advice on Location of Meetings*

62. NPFC-2023-COM07-WP10 describes an approach for funding meetings if no host is identified. The issue relates to how to support the costs of COM-related meetings (COM, TCC and FAC) in the event that no Member offers to host them.
63. Japan acknowledged that the default location of meetings organized through the Secretariat would be Tokyo or Yokohama. They noted that this approach aligns with other RFMOs such as IATTC and IOTC where the meetings, unless hosted by a Member, are held at the location of the Secretariat and with costs covered by the Commission.
64. Members thanked Japan for hosting many NPFC meetings to date and supported the approach outlined in NPFC-2023-FAC05-WP10.
65. Some Members questioned the estimate of ¥20,000,000 needed from the Commission budget to support a “no-host” meeting.
66. The Executive Secretary explained that this is the amount Japan estimated based on their experience hosting the current set of meetings in Sapporo and current costs. He noted that one option for Members would be to consider using the voluntary contributions from Panama, if renewed as CNCP, to defray a portion of the cost.
67. **Recommendation 20:** FAC05 recommends to COM07 that in the event of a “no-host” meeting of the Commission (and associated subsidiary bodies, i.e. TCC and FAC), the meeting would be held in Japan (Tokyo/Yokohama area) and require an allocation of ¥20,000,000 in the Commission 2023/24 budget to fully support the meeting costs for one set of meetings. This funding would need to be renewed in future years if no meeting hosts are identified.

8.6 *FAC Chair and Vice-Chair*

68. Mr. Dan Hull (United States) was nominated as FAC Chair. Mr. Luoliang Xu (China) was nominated as FAC Vice-Chair.
69. **Recommendation 21.** FAC05 recommends to COM07 that Mr. Dan Hull (United States) serve as FAC Chair and Mr. Luoliang Xu (China) serve as FAC Vice-Chair starting at the conclusion of the Commission meeting which appoints them and serving for a two-year term.

Agenda Item 9. Next Meeting

70. **Recommendation 22:** FAC05 recommended to COM07 that it consider holding the next meeting of the FAC (FAC06) in conjunction with the next meeting of the Commission (COM08).

Agenda Item 10. Recommendations to the Commission

71. The recommendations of FAC05 to COM07 contained in the report were adopted by consensus.

Agenda Item 11. Adoption of the Report

72. The report was adopted by consensus.

Agenda Item 12. Close of the Meeting

73. FAC05 closed at 19:19 on 21 March 2023.

FAC05 Final Report List of Annexes

Annex A: FAC05 Agenda

Annex B: FAC05 List of Documents

Annex C: FAC05 List of Participants

Annex D: Secretariat's Workplan for 2023/24

Annex E: Commission Budgets for 2023/24 to 2026/27

Annex F: Members Contributions for 2023/24 and 2024/25

Annex A FAC05 Agenda

North Pacific Fisheries Commission
5th Meeting of the Finance and Administration Committee
17 March 2023 JST
Japan
Agenda

1. Opening of the Meeting
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Financial Statement
 - a. Audit Report for the 2021/2022 fiscal year
 - b. Secretariat financial update for the first three quarters of 2022/2023 fiscal year (i.e., April 1 to December 31 2022)
 - c. Status of Member Contributions for 2021/2022 fiscal year and 2022/2023 fiscal years to December 31, 2022
 - d. Status of Other Funds as of December 31, 2022
 - i. Working Capital Fund
 - ii. Voluntary Contribution
 - iii. Special Project Fund
5. Secretariat's Work Plan: Budget Estimates for 2023/2024 to 2025/2026
 - a. Secretariat Work Plan 2023/2024 to 2025/2026
 - b. Budget for 2023/2024
 - c. Budget estimates for 2023/2024 and 2024/2025 and indicative budget estimates for 2025/2026 and 2026/2027
 - d. Consideration of staff remuneration/benefits package:
 - i. GS level
 - ii. Professional level (including repatriation allowance)

Annex A FAC05 Agenda

6. Administration Matters

a. NPFC Secondment and Internship programs

b. Transparency

7. Performance Review and items of relevance to FAC

8. Other matters

9. Next meeting

10. Recommendations to the Commission

11. Adoption of the Report

12. Close of the Meeting

Annex B FAC05 List of Documents

LIST OF DOCUMENTS**MEETING INFORMATION PAPERS**

Number	Title
NPFC-2023-COM07/TCC06/FAC05-MIP01	Meeting Information
NPFC-2023-FAC05-MIP02	Provisional Agenda
NPFC-2023-FAC05-MIP03 Rev.1	Annotated Indicative Provisional Agenda

REFERENCE DOCUMENTS

Symbol	Title
NPFC-2023-COM07-WP10	Location of Commission meetings

WORKING PAPERS

Symbol	Title
NPFC-2023-FAC05-WP01	Draft Commission Budgets 2023-2026.pdf
NPFC-2023-FAC05-WP02	Secretariat Work Plan 2023-2024
NPFC-2023-FAC05_TCC06-WP03	Considerations for Updates to NPFC Document Rules
NPFC-2023-FAC05-WP04	NPFC Intern and Secondment Program Fiscal Year 2023/2024
NPFC-2023-FAC05-WP05	Consideration of General Service (GS) Staff Remuneration
NPFC-2023-FAC05-WP06	Request from Retired Compliance Manager
NPFC-2023-FAC05-WP07	FAC and TCC Considerations of Draft MOU with SPRFMO
NPFC-2023-FAC05-WP08	Considerations of the Performance Review
NPFC-2023-FAC05-WP09	FAC TCC Considerations of Draft MOU with WCPFC
NPFC-2023-FAC05-WP10	Revision to NPFC Staff Selection Policy and Individual Performance Review

Annex B FAC05 List of Documents

NPFC-2023-FAC05-WP11	NPFC funds and proposal to establish a general fund
NPFC-2023-FAC05-WP12	Cooperation with the International Scientific Committee
NPFC-2023-FAC05-WP13	Legal advisory consultant

INFORMATION PAPERS

Symbol	Title
NPFC-2023-FAC05-IP01	NPFC Auditor’s Report for 2020/2021 Financial Year
NPFC-2023-FAC05-IP02	NPFC Auditor’s Report for 2021/2022 Financial Year

Annex C FAC05 List of Participants

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Annex D Secretariat's Workplan for 2023/24

SECRETARIAT WORK PLAN 2023/2024

ABSTRACT

This paper addresses a Secretariat's work plan for the 2023/2024 fiscal year for four key areas:

- (a) Coordination of scientific activities of the Commission;
- (b) Coordination of compliance activities and operational reporting to the Commission;
- (c) Data management and security;
- (d) Provision of finance and administration services to support the Commission in the execution of Secretariat's work plan

* The work plan will be informed by COM07 decisions.

DETAILS:

The function of the NPFC Secretariat is the provision of services to, and representation of the Commission as determined by its Members in accordance with the Convention and relevant rules and regulations. As identified by the Secretariat and shared with Members, four key areas highlighted below provide the Secretariat and the Commission guidance with regard to the Commission's activities in 2023/2024 fiscal year.

I. Coordination of scientific activities of the Commission

The Secretariat coordinates the scientific activities of the Commission including:

- a. Implementation and revision, when necessary, of the Scientific Committee rolling Five-Year Research Plan and Work Plan for each Priority Area:
 - Stock assessments for target fisheries and bycatch species
 - Ecosystem approach to fisheries management
 - Data collection, management and security
(refer to Annex R of the 7th SC Report for details).
- b. Assisting Members in sharing data and updating joint spatial/temporal map of Members' catch and effort on Pacific saury and map of bottom fishery footprint
- c. Coordinating meetings of the Small Scientific Committee on Pacific saury (SSC PS11 and SSC PS12) to be held on 28-31 August and 11-14 December 2023
- d. Coordinating meetings of the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA07 and TWG CMSA08) to be held on 4-7 September 2023 and in late January 2024.
- e. Coordinating SSC BF-ME04 meeting to be held on 7-9 December 2023
- f. Coordinating SC08 meeting to be held on 15-19 December 2023
- g. Assisting Members in identifying data gaps which can be fulfilled by an observer program

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- h. Assisting Members in selection and contracting invited experts:
 - to develop an operating model and test candidate stock assessment models for chub mackerel
 - to facilitate work and provide advice at SSC PS meetings
 - to support the development of an interim HCR and MSE for Pacific saury (joint SC-TCC-COM project)
- i. Promoting cooperation with other organizations
 - NPAFC: five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (in progress); macro-scale multinational survey in the North Pacific in 2022 (completed, data from the survey are available)
 - PICES: PICES annual meeting in 2023, PICES-ICES SPF Working Group, PICES Working Group on Seamount Ecology
 - FAO: proposed partnership with FIRMS; continued cooperation with ABNJ Deep Sea Fisheries project
 - BECI: following up with the developments of the Basin Scale Events to Coastal Impacts (BECI) project
- j. Coordinating an international course for NPFC observers for VME indicator taxa in cooperation with PICES (postponed)
- k. Coordinating scientific projects to be conducted during 2023 (see the table below for details)
- l. Coordinating intersessional activities of the SC and its subsidiary bodies (TWG CMSA, SSC BF-ME, SSC PS) as specified in the SC Work Plan
- m. Coordinating intersessional activities and meetings of the Small Working Groups (SWG on Operating Model, SWG on North Pacific Armorhead and Splendid Alfonsino, SWG on Vulnerable Marine Ecosystems, SWG on Japanese Sardine, SWG on Blue Mackerel, SWG on Japanese Flying Squid and SWG on Neon Flying Squid)
- n. Contributing to an MSE process for Pacific saury and assisting in technical developments conducted by Members and external expert
- o. Liaising with TCC for issues of common interest
- p. Assisting Members with addressing science-related recommendations from the NPFC Performance Review report

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#	Project	Time	Status	Next step: activities, required funds
1.1	GIS database/module as a part of NPFC database management system for spatial management of bottom fisheries and VMEs	2018-	<i>In progress</i> A map of bottom fishing footprint has been deployed on the NPFC website.	Further development of the map. <i>2023 FY: 0,7mil JPY (5,000USD).</i> <i>Source: Database management.</i>
1.2	Joint spatial/temporal map of Members' catch and effort on Pacific saury with a spatial resolution of one-degree grids and a temporal resolution of one month.	2018-	<i>In progress.</i> Spatial/temporal map of Members' Pacific saury catch and effort has been updated up to 2021.	Update the map up to 2022. <i>2023 FY: 0,2mil JPY (1,500USD).</i> <i>Source: Database management.</i>
2	Pacific saury stock assessment meeting (meeting costs)	Every year	<i>TWG PSSA meetings: Feb 2017, Dec 2017, Nov 2018, Mar 2019.</i> <i>SSC PS meetings: Nov 2019, Nov 2020, Oct 2021.</i>	SSC PS11 meeting. Dates TBD. <i>2023 FY: 1.4mil JPY (10,000USD)</i> <i>Source: SC fund.</i>
3	Chub mackerel stock assessment meeting (meeting costs)	Every year	<i>TWG CMSA meetings: Dec 2017, Mar 2019, Nov 2020, Jun 2021.</i>	TWG CMSA07 and 08 meetings. Dates TBD. <i>2023 FY: 4.2mil JPY (15,000USD x 2 mtngs)</i> <i>Source: SC fund.</i>
4	Expert to review Pacific saury stock assessment (consultant fee and travel costs)	TBD	<i>Under consideration.</i> SSC PS: to determine time and format.	<i>2023 FY: No funds required.</i>

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5	Observer Program	2018-	<p><i>In progress</i></p> <p>A study on the existing observer programs of Members and those of other RFMOs has been done.</p> <p>Scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means for Pacific saury have been reviewed (SSC PS04 report, Annex E).</p>	<p>Identify data gaps which can be fulfilled by an observer program.</p> <p><i>2023 FY: No funds required.</i></p>
6	Promotion of cooperation with NPAFC including macro-scale multinational survey in the North Pacific in 2022	2021-	<p><i>In progress.</i></p> <p>The SC provided suggestions to the work plan to implement the MOC between the NPFC and NPAFC.</p> <p>The NPAFC reported on the 2022 IYS Winter High Seas Research Expedition which was co-sponsored by NPFC.</p>	<p><i>2023 FY: No funds required.</i></p>
7	Invited expert to support TWG CMSA (consultant fee and travel costs)	2020-	<p>An external expert has been contracted to support the TWG CMSA in testing candidate stock assessment models.</p>	<p><i>2023 FY: 1,4mil JPY (10,000USD)</i></p> <p><i>Source: SC fund.</i></p>
8	Invited expert to support SSC PS (consultant fee and travel costs)	2019-	<p>An external expert has been contracted to support SSC PS during its meetings.</p>	<p><i>2023 FY: 2.1mil JPY (15,000USD)</i></p> <p><i>Source: SC fund.</i></p>

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9	Standardization of bycatch species list and fish species identification guides (translation of the existing fish ID guide from Japanese to additional languages)	2019-2022	<i>In progress.</i> Bycatch species list has been compiled. The fish ID guide has been submitted to SSC BF-ME for review.	Printing costs. <i>2022 FY: 1.4mil JPY (10,000USD).</i> <i>Source: SC fund.</i>
10	PICES Annual meeting	Every year		<i>Travel support to a participant of the SC or its subsidiary bodies.</i> <i>2023 FY: 1mil JPY (7,000USD)</i> <i>Source: SC fund.</i>
11	SWG MSE PS (meeting costs)	2022-	<i>Proposed.</i>	SWG MSE PS04. Dates TBD. <i>2023 FY: 1.4mil JPY (10,000USD)</i> <i>Source: Special Project fund.</i>
12	PICES 2023 session on Seamount Ecology and VME Identification	2023	<i>Proposed.</i> This session will be co-convened by SC participants, and WG47 co-chairs and members.	<i>2023 FY: 0.7mil JPY (5,000USD)</i> <i>Source: SC Fund</i>
13	Understanding the basis by which other RFMOs' VME encounter thresholds were determined by taxa and gear-type	2023	<i>Proposed.</i>	<i>2023 FY: 0.7mil JPY (5,000USD)</i> <i>Source: SC Fund</i>
	Total			<i>2022 FY: SC Fund 1.4mil JPY.</i> <i>2023 FY: SC Fund 11,5mil.</i> <i>Database management 0.9mil.</i> <i>2023 FY: Special Project Fund 1.4mil JPY.</i>

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II. Coordination of compliance activities of the Commission

* Note that compliance specific activities in 2023 have not yet been established by TCC consequently the list of Secretariat-intended activities in this sector is only tentative.

The Secretariat coordinates compliance activities of the Commission including:

- a. Implementation of compliance work plan and priorities through the two SWGs, Operations and Planning and Development, to address the following:
 - VMS software consultancy for 3rd year
 - Data Sharing and Data Security Protocol for NPFC
 - Refinements to the Vessel Registry
 - Developing Compliance Monitoring Scheme
 - HSBI procedure under COVID-19 pandemic
 - Development of CMM for transshipment
 - Development of transparency policy pertinent to TCC
- b. Coordinating and assisting Members to hold annual TCC and SWG meetings in 2023
- c. Review of existing CMMs for revision and consideration of new CMMs, if any, from Members
- d. Maintain the vessel register and assistance to new CNCPs as they join the Commission
- e. Maintain and upgrade the e-IUU vessel system, e-annual report system, and development of the data warehouse to assist the Commission in the analysis of the data
- f. Coordinate the e- IUU vessel listing process from data submitted by Members
- g. Provide Draft Compliance report for TCC06 meeting and e- CMS for future years
- h. Address VMS and other electronic monitoring systems to assess compliance as directed by the Commission
- i. Conduct a preliminary study towards the establishment of robust transshipment measures
- j. Address COM06 tasks that were unable to be addressed this year, e.g., robust effort indicators, etc.
- k. Promoting cooperation with other organizations in compliance: IMCS, TCN, PPFCN, NPAFC, WCPFC, SPRFMO.
- l. Other tasking to be set at TCC06 and COM07

III. Data management and security and Information Technology

The data management system is the core for the storage of data and the analyses of scientific and compliance operations of the Commission, consequently, significant effort is being placed on the development of this system. The intent of the NPFC Database is to provide a secure, user-friendly, accessible, and reliable data compilation for scientific and compliance needs of the Commission.

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The Database is intended to be integrated with other data modules of the Commission to support the Members' decision-making process. The efficiency with which the Secretariat provides service to the Members, and others, through electronic means is also important. The Secretariat has evaluated its current legacy system, established for the interim secretariat prior to the establishment of the Commission, and will modernize it to reflect current practice (accessibility, collaboration, security, etc.) as done for the database and the NPFC VMS.

- a. The Secretariat will update the NPFC website regularly to enhance public awareness and to give Members access to the systems required in the various operations of the Commission.
- b. The Secretariat will enhance existing web-based systems for the Commission: Meeting Management, Calendar, Pacific Saury Weekly Report, GIS Maps for Pacific saury and bottom fishing, Collaboration site, eAnnual Report, eIUU, eHSBI, HSBI Events, Vessel Registry, CMM Chart of Accounts, Data Warehouse Dashboard, and other existing applications.
- c. The Secretariat will continue to oversee the development of VMS.
- d. The Secretariat will continue to update and improve the NPFC data management system to align it with the NPFC Data Sharing and Data Security Protocols (pending adoption by COM07).
- e. The Secretariat will arrange for the development of new systems in response to the needs of Members.
- f. The Secretariat will improve HR and administrative operations through enhancing the existing HR and administration system.

IV. Finance and Administration

1. Financial matters to support the Secretariat and Commission in the execution of its duties

Securing funds for the Commission's activities and implementation of approved activities through formal and internationally recognized financial mechanisms is one of the areas for the Secretariat to assist Members and the Commission to achieve objectives of the Convention.

Following are the major financial activities for 2022:

- a. Drafting a four-year budget plan 2022-2025 (proposed budgets for 2022-2023, indicative budgets for 2024-2025) for approval at the 7th Commission meeting;
- b. Submission of the external Auditor's Report for the Commission's 2020 financial affairs

2. Provision of administrative services to the Commission and its subsidiary bodies

1) Hosting Commission meetings

The Secretariat facilitates all NPFC meetings to be held in 2023 by providing logistical support and

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preparing meeting documents and reports:

- a. Commission and Subsidiary-body Meetings
 - 5th Finance and Administration Committee (FAC), 17 March
 - 6th Technical and Compliance Committee (TCC), 18-20 March
 - 7th Annual Session of the Commission, 22-24 March
 - 8th Scientific Committee, 15-19 December
- b. Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) meetings
 - SWG MSE PS03, 28 February-1 March
 - SWG MSE PS04, 31 August-2 September
- c. Small Scientific Committees and Technical Working Group meetings
 - SSC PS11 and SSC PS12, 28-31 August and 11-14 December
 - SSC BF-ME04, 7-9 December 2022
 - TWG CMSA07 and TWG CMSA08, 4-7 September 2023 and late January 2024
- d. TCC SWGs to take place monthly during the intersessional period
- e. SC SWGs meetings to take place as decided by the SC

2) Cooperation with other organizations

The Secretariat currently liaises with other organizations including RFMOs by attending their meetings for information sharing and for developing other joint or reciprocal activities of mutual interest. In 2023, the meetings scheduled to be represented by Secretariat staff are as follows:

Meeting	Date and place	Purpose	Expected outcomes
IFOMC International Fisheries Observer and Monitoring Conference	6-10 March 2023 Hobart, Australia	Secretariat (Secondee) to attend this conference to learn about new developments and innovative technologies in electronic monitoring	To inform Members about new developments in observer program implementation and operation and new technologies for electronic monitoring and reporting.

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UN BBNJ	7-18 March, online	Secretariat to attend the meeting to support the development of the BBNJ legislation in a manner that recognizes and includes the appropriate role for deep-sea RFMOs and does not undermine current legal instruments for these RFMOs	Assist Members and cooperate with other RFMOs in this exercise which results in an internationally legally binding instrument for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction.
UN DOALOS Ecosystem Approach to Management	17-19 March	Secretariat Representative to be determined, if possible, noting internal meeting overlaps.	Preparatory meeting for the UNFSA Review Conference in 2023.
PSMA Strategy ad hoc Working Group	3-7 April, online	Secretariat representative to attend WG meeting to enhance understanding of PSMA implementation process	Enhance capacity to assist Members in implementation of port state measures in NPFC
GFETW (Global Fisheries Enforcement Training Workshop)	29 July – 4 Aug 2023 Halifax, Canada	CM to attend IMCS Network's GFETW to network with the international MCS	Informal networking for enhanced global cooperation for information sharing on MCS issues
PPFCN		CM to attend Pan-Pacific Fisheries Compliance Network meetings	Informal networking and sharing of MCS practices, ideas and initiatives to move towards more common approaches and processes amongst the RFMOs in the Pacific Ocean basin and address gaps created by differing systems.
NPAFC Annual Meeting	15-19 May 2023, Busan, Republic of Korea	Secretariat to attend annual meeting of NPAFC	Facilitation of cooperation with NPAFC based on the work plan to be agreed by both Commissions to implement MOC established in 2019

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ISC	Japan 12-17 July 2023	Secretariat to attend annual meeting	Discussion on the scientific aspects of cooperation with ISC / NC, sharing experience in assessment of pelagic fish.
NC Meeting	Fukuoka, Japan 6-7 July 2023	Secretariat to attend annual meeting	Facilitation of cooperation between NPFC and WCPFC/NC through the development of a formal MOU relationship
WCPFC TCC 20-26 September 2023	Pohnpei, FSM	Secretariat to attend TCC 19	Facilitation of cooperation between NPFC and WCPFC and develop understanding of MCS approaches in the Pacific RFMOs.
PICES Annual meeting	23 -27 October 2023, Seattle, USA	Secretariat to attend annual meeting of PICES and intersessional meetings of its committees and working groups	Enhancing scientific cooperation between NPFC and PICES as specified in the Framework for cooperation, including such key areas as Stock assessment support, VMEs and Ecosystem Approach to Fisheries.
SPRFMO SC meeting	Late September, Panama	Secretariat to attend SPRFMO SC11 meeting	Discussion on the scientific aspects of cooperation with SPRFMO, sharing experience in assessment of pelagic and bottom fish and establishment of an observer program for pelagic fisheries.
WCPFC Annual Meeting	December 4-8 2023 Rarotonga, Cook Islands	Secretariat to attend annual meeting of WCPFC to discuss issues of common interest especially compliance issues	Facilitation of cooperation between NPFC and WCPFC through the development of a formal MOU relationship

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SPRFMO Annual meeting	January 23-February 2024 Manta, Ecuador	Secretariat to attend annual meeting of SPRFMO to discuss issues of common interest.	Facilitation of cooperation between NPFC and SPRFMO through the development /implementation of a formal
PPFCN (Pan Pacific Fisheries Compliance Network)	Unknown, Tokyo	Secretariat will offer to host a face-to-face meeting of the PPCFN during 2023/24 fiscal year	To facilitate collaboration among Pacific compliance community to explore options for implementing future MoUs and general exchange of information and best practices in MCS.

Further representation will be determined at TCC, FAC and the Commission Meetings.

Besides attendance at the meetings, there are areas for cooperation with other organizations, which require further consideration and input from the Commission:

- a. Development of MOU between NPFC and WCPFC to cooperate in the areas of mutual interest especially for compliance to stop IUU fishing activities in the Convention Area
- b. Development of MOU between NPFC and SPRFMO as proposed by the Executive Secretary of SPRFMO in 2019. SPRFMO submitted revised MOU text for consideration by NPFC Members at the sixth Commission meeting but deferred to next Commission meeting due to time constraints.
- c. Development of MOU between NPFC and IMCS Network to cooperate in compliance as proposed by IMCS Network in 2021. Discussion on this matter was deferred to next Commission meeting due to time constraints.
- d. Cooperation for compliance purposes to be determined by TCC and the Commission, e.g., NPAFC for air surveillance and HSBI for salmon bycatch, USCG for HSBI, all members for VMS and HSBI, Pan Pacific Fisheries Compliance Network, TCN and IUU Interchange group.
- e. Cooperation with FAO ABNJ Deep Sea Fisheries Project Phase 2 as one of the partner organizations with commitment of in-kind contribution to the project

3) Enhancing public awareness

The Secretariat will enhance public awareness through various means:

- a. Update NPFC brochures
- b. Maintain and update official website to provide the public information on Commission’s activities

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- c. Give lectures and seminars relevant to NPFC work upon request from local government or universities and international fora
- d. Submit articles to newsletters of RSN and RFMOs
- e. Publish the NPFC Yearbook to entail activities of the Commission for 2021
- f. Receive visitors from international organizations, local government, embassies, and universities

4) Management of human resources

Effective management of human resources intends to maximize employee performance while considering the best economic use of the resources of the Commission. According to the Secretariat's Work Plan and Commission's decision, the Secretariat will coordinate the following:

- a. Conduct annual performance reviews of the Secretariat staff for 2022/2023 fiscal year (April 2022-March 2023): staff performance review by Executive Secretary, and a performance review of the Executive Secretary by the Commission.
- b. Identify possible approaches to establish a remuneration approach and salary scale for GS staff including a contracted study of domestic practices, as needed.
- c. Identify approach to address concern identified by the retired Compliance Manager related to the use of the fixed exchange rate to calculate payment of salary in JPY from salaries established in USD. Goal is to address inflation and exchange rate issues.
- d. Ensure Secretariat complies with Japanese labor law related to benefits for Japanese staff (e.g., pension options).
- e. Manage interns and secondees from Members after consideration and approval by the Commission.

Annex E Commission Budgets for 2023/24 to 2026/27

	Year 2023/24	Year 2024/25	Year 2025/26	Year 2026/27
	Proposed	Proposed	Estimated	Estimated
Items	Cost (JPY)	Cost (JPY)	Cost (JPY)	Cost (JPY)
1. PERSONNEL COSTS				
1.1 Executive Secretary	18,151,704	18,508,126	18,508,126	18,876,853
1.2 Professional Category CM	13,204,548	13,967,112	13,967,112	14,269,533
1.3 Professional Category SM	14,702,700	15,176,798	15,176,798	15,478,447
1.4 General Services Category EA	7,789,956	7,906,805	8,025,407	8,145,789
1.5 General Services Category DC	7,314,000	7,423,710	7,535,066	7,648,092
1.6 General Services Category 3	0	0	0	0
1.7 Temporary Services	0	0	0	0
1.8 (a) Social Security & Insurance	6,100,000	6,300,000	6,500,000	6,500,000
1.8 (b) Pension Costs	9,419,088	9,699,313	9,734,726	9,920,482
1.9 Overtime	500,000	500,000	500,000	500,000
1.10 (a) Staff Allowances - Home Leave	2,650,000	1,000,000	2,200,000	1,000,000
1.10 (b) Staff Allowances – Relocation	773,000	0	0	0
1.10 (C) Staff Allowances – Repatriation	3,000,000	3,000,000	2,000,000	2,000,000
1.10 (d) Staff Allowances - Accommodation Subsidy	8,400,000	9,100,000	8,400,000	9,100,000
1.11 Professional Development / Training	1,000,000	1,000,000	1,000,000	1,000,000
1.12 Education Fee	1,500,000	1,500,000	1,500,000	1,500,000
1.13 Separation Allowances	0	0	0	0
2. OTHER SERVICE COSTS				
2.1 Office Equipment & Furniture	2,500,000	2,500,000	2,500,000	2,500,000
2.2 Office Supplies	1,300,000	1,300,000	1,300,000	1,300,000
2.3 Rentals	0	0	0	0
2.4 Communications	1,300,000	1,300,000	1,300,000	1,300,000
2.5 Printing	350,000	350,000	350,000	350,000
2.6 Duty Travel	7,000,000	7,000,000	7,000,000	7,000,000
2.7 Auditing	900,000	900,000	900,000	900,000
2.8 Contractual Services	10,000,000	10,000,000	10,000,000	10,000,000
2.9 Database Management	10,000,000	10,000,000	11,000,000	11,000,000
2.10 MCS Costs	13,000,000	13,000,000	13,000,000	13,000,000
2.11 Meeting Costs & Workshops	26,000,000	26,000,000	26,000,000	26,000,000
2.12 Science Support	12,000,000	12,000,000	12,000,000	12,000,000

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2.13 Staff Recruitment & Hiring	1,000,000	1,000,000	1,000,000	1,000,000
2.14 To / From Working Capital Fund	-20,000,000	-20,000,000	-20,000,000	-20,000,000
2.14 bis To/From Special Project Fund	0	0	0	0
2.15 Representation Expenses	250,000	250,000	250,000	250,000
2.16 Miscellaneous	700,000	700,000	700,000	700,000
TOTAL	160,804,996	161,381,864	162,347,235	163,239,195

Annex F Members Contributions for 2023/24 and 2024/25

Member/Rule	a)	b)	c)	Fixed Contribution	Total	%
Canada	5,110,219	2,936	2,479,917		7,593,071	4.7
China	5,110,219	50,839,502	571,160		56,520,881	35.1
EU	5,110,219	0	1,596,567		6,706,785	4.2
Korea	5,110,219	1,190,770	1,457,024		7,758,013	4.8
Russia	5,110,219	512,204	615,998		6,238,421	3.9
Chinese Taipei	5,110,219	11,221,003	1,543,348		17,874,569	11.1
USA	5,110,219	0	3,286,162		8,396,381	5.2
Vanuatu	5,110,219	476,333	130,323		5,716,875	3.6
Japan				44,000,000	44,000,000	27.4
Total	40,881,749	64,242,748	11,680,500	44,000,000	160,804,996	100

Annex P Commission Budgets for 2023/24 to 2026/27

	Year 2023/24 Proposed	Year 2024/25 Proposed	Year 2025/26 Estimated	Year 2026/27 Estimated
Items	Cost (JPY)	Cost (JPY)	Cost (JPY)	Cost (JPY)
1. PERSONNEL COSTS				
1.1 Executive Secretary	18,151,704	18,508,126	18,508,126	18,876,853
1.2 Professional Category CM	13,204,548	13,967,112	13,967,112	14,269,533
1.3 Professional Category SM	14,702,700	15,176,798	15,176,798	15,478,447
1.4 General Services Category EA	7,789,956	7,906,805	8,025,407	8,145,789
1.5 General Services Category DC	7,314,000	7,423,710	7,535,066	7,648,092
1.6 General Services Category 3	0	0	0	0
1.7 Temporary Services	0	0	0	0
1.8 (a) Social Security & Insurance	6,100,000	6,300,000	6,500,000	6,500,000
1.8 (b) Pension Costs	9,419,088	9,699,313	9,734,726	9,920,482
1.9 Overtime	500,000	500,000	500,000	500,000
1.10 (a) Staff Allowances - Home Leave	2,650,000	1,000,000	2,200,000	1,000,000
1.10 (b) Staff Allowances – Relocation	773,000	0	0	0
1.10 (C) Staff Allowances – Repatriation	3,000,000	3,000,000	2,000,000	2,000,000
1.10 (d) Staff Allowances - Accommodation Subsidy	8,400,000	9,100,000	8,400,000	9,100,000
1.11 Professional Development / Training	1,000,000	1,000,000	1,000,000	1,000,000
1.12 Education Fee	1,500,000	1,500,000	1,500,000	1,500,000
1.13 Separation Allowances	0	0	0	0
2. OTHER SERVICE COSTS				
2.1 Office Equipment & Furniture	2,500,000	2,500,000	2,500,000	2,500,000
2.2 Office Supplies	1,300,000	1,300,000	1,300,000	1,300,000
2.3 Rentals	0	0	0	0
2.4 Communications	1,300,000	1,300,000	1,300,000	1,300,000
2.5 Printing	350,000	350,000	350,000	350,000
2.6 Duty Travel	7,000,000	7,000,000	7,000,000	7,000,000
2.7 Auditing	900,000	900,000	900,000	900,000
2.8 Contractual Services	10,000,000	10,000,000	10,000,000	10,000,000
2.9 Database Management	10,000,000	10,000,000	11,000,000	11,000,000
2.10 MCS Costs	13,000,000	13,000,000	13,000,000	13,000,000
2.11 Meeting Costs & Workshops	26,000,000	26,000,000	26,000,000	26,000,000
2.12 Science Support	12,000,000	12,000,000	12,000,000	12,000,000
2.13 Staff Recruitment & Hiring	1,000,000	1,000,000	1,000,000	1,000,000
2.14 To / From Working Capital Fund	-20,000,000	-20,000,000	-20,000,000	-20,000,000
2.14 bis To/From Special Project Fund	0	0	0	0
2.15 Representation Expenses	250,000	250,000	250,000	250,000
2.16 Miscellaneous	700,000	700,000	700,000	700,000
TOTAL	160,804,996	161,381,864	162,347,235	163,239,195

Annex Q Assessed Contribution for 2023/24 and 2024/25

Member\Rule	a)	b)	c)	Fixed Contribution	Total	%
Canada	5,110,219	2,936	2,479,917		7,593,071	4.7
China	5,110,219	50,839,502	571,160		56,520,881	35.1
EU	5,110,219	0	1,596,567		6,706,785	4.2
Korea	5,110,219	1,190,770	1,457,024		7,758,013	4.8
Russia	5,110,219	512,204	615,998		6,238,421	3.9
Chinese Taipei	5,110,219	11,221,003	1,543,348		17,874,569	11.1
USA	5,110,219	0	3,286,162		8,396,381	5.2
Vanuatu	5,110,219	476,333	130,323		5,716,875	3.6
Japan				44,000,000	44,000,000	27.4
Total	40,881,749	64,242,748	11,680,500	44,000,000	160,804,996	100



Annex R: SWG MSE PS01 Report

North Pacific Fisheries Commission

NPFC-2022-SWG MSE PS01-Final Report

**1st Meeting of the Joint SC-TCC-COM Small Working Group on
Management Strategy Evaluation for Pacific Saury (SWG MSE PS)
REPORT**

21-22 February 2022

March 2022

This paper may be cited in the following manner:

Small Working Group on Management Strategy Evaluation for Pacific Saury. 2022. 1st Meeting Report. NPFC-2022-SWG MSE PS01-Final Report. 14 pp. (Available at www.npfc.int)

North Pacific Fisheries Commission
1st Meeting of the Joint SC-TCC-COM Small Working Group on
Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

21-22 February 2022

WebEx

REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 1st meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America and Vanuatu. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Penelope Ridings and Dr. Andrew Wright attended as Secretariat Guests in their role as Panelists for the first NPFC Performance Review. The meeting was opened by Dr. Toshihide Kitakado (Japan) and Mr. Justin Turple (Canada), who served as Co-Chairs.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.
4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Role of the joint SWG MSE PS and review of the Terms of Reference

2.1 Commission's request and CMM 2021-08

5. The Science Manager explained the Commission's request to establish the SWG MSE PS, as described in paragraph 15 of Conservation and Management Measure 2021-08 for Pacific Saury.

2.2 Confirmation of NPFC priority on management

6. The Science Manager explained the NPFC priority on management, highlighting the following:
 - (a) Adopting measures, based on the best scientific information available, to ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield (Article 3(b) of the Convention);
 - (b) Adopt, where necessary, management strategies for any fisheries resources (Article 7(1)(d) of the Convention);
 - (c) Provide analysis to the Commission of alternative conservation and management measures (Article 10(4)(j) of the Convention).

2.3 Review of the Terms of Reference

7. The SWG MSE PS reviewed the Terms of Reference (TOR) and determined that no revisions are currently necessary.

Agenda Item 3. General overview of an MSE process

3.1 Basic and general concept of MSE

8. Dr. Kitakado outlined the basic and general concept of MSE, highlighting the following necessary steps (not necessarily in sequence):
 - (a) Identification of management objectives and performance measures;
 - (b) Development of operating models (OMs);
 - (c) Development of management procedures (MPs);
 - (d) Simulation testing of MPs with the OMs;
 - (e) Selection of an MP based on simulation performance;
 - (f) Implementation of the MP.
9. Dr. Kitakado explained the difference between projection based on stock assessment and projection in MSE, the difference between an MP and a harvest control rule (HCR), and what an OM is and how it differs from an assessment model (see NPFC-2022-SWG MSE PS01-IP01 for details).
10. In response to a request for further clarification of the difference between OMs and assessment models and how each accounts for uncertainty, Dr. Kitakado explained that both assessment models and OMs consider a certain level of uncertainty but that OMs can also consider an additional level of uncertainty compared to assessment models. Dr. Kitakado suggested that reference case scenarios could be developed for the OM with a similar level of uncertainty to the current assessment model and that these would provide the main outcomes when testing the MPs. In addition, additional scenarios with a greater level of uncertainty could be developed to

test the robustness of the MPs.

11. In response to a request for further elaboration on performance measures/metrics, Dr. Kitakado explained that performance measures/metrics measure the extent to which a management objective is being met. These include measures/metrics for both conservation and fisheries performance.

3.2 Reference points, stock status and risks

12. Dr. Kitakado provided an overview of reference points and explained that limit reference points indicate a biological limit beyond which the state of stock/fishing mortality is undesirable and that target reference points indicate a desired level of biomass/harvest.
13. Dr. Kitakado provided an overview of Kobe plots, Majuro plots, and combined plots as means of representing stock status.

3.3 Potential issues regarding MSE for Pacific saury (and small pelagic fish in general)

14. Dr. Kitakado explained some potential issues regarding MSE for Pacific saury that were raised at the NPFC Biological Reference Point/Harvest Control Rule/Management Strategy Evaluation Workshop held in 2019, namely:
 - (a) Pristine biomass (B_0) is not always well estimated for short-lived and highly variable stocks, such as small pelagic species, and B_0 -based reference points should not be used for such species;
 - (b) The importance of tailoring reference points to life history characteristics such as growth and maturity and also to variability in recruitment, understanding the weaknesses and uncertainties inherent in reference points, and testing the robustness of reference points for fishing mortality and spawning stock biomass;
 - (c) Age-structured stock assessment models would be more appropriate than age-aggregated models and age-structured operating models are preferable to length-based operating models.

Agenda Item 4. Initial discussion toward development of an interim harvest control rule (HCR) for the short-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

4.2 Technical matters on operating models, HCRs, performance measures and simulation

15. Dr. Kitakado summarized the outcomes of the 8th meeting of the Small Scientific Committee on Pacific Saury (SSC PS08), focusing on the following recommendations:
 - (a) The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury

(333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach ($B_{2021} * F_{MSY} = 192,804$ tons) and the current biomass is much lower than B_{MSY} . Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons);

- (b) A harvest control rule that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

16. Dr. Kitakado presented a strawman proposal for technical developments toward setting an interim HCR for the short-term (NPFC-2022-SWG MSE PS01-WP01), using a Shiny application, to facilitate the discussions of the SWG MSE PS.
17. The SWG MSE PS considered potential reference points. Noting that, according to Article 3(b) of the Convention, fisheries resources are to be maintained at or restored to levels capable of producing maximum sustainable yield, the SWG MSE PS agreed that first priority should be given to MSY-based reference points. In the case of target and limit reference points for the stock, these could be $B_{tar} = c * B_{MSY}$ or $c * K$ and $B_{lim} = c * B_{MSY}$ or $c * K$. In the case of target and limit reference points for the fishing intensity, these could be $F_{tar} = c * F_{MSY}$ and $F_{lim} = c * F_{MSY}$. In addition, the SWG MSE PS suggested that reference points based on a certain percentage of fish stock level, such as $F_{tar} = F(100c\% \text{ of } K \text{ or } B_0)$ and $F_{lim} = F(100c\% \text{ of } K \text{ or } B_0\%)$, could also be considered.
18. The SWG MSE PS discussed three types of management objective: recovery of the stock, avoiding unsustainable state of the stock, and achieving high and stable catch.
19. Regarding recovery of the stock, the SWG MSE PS agreed that this should be given the highest priority in light of the current status of the stock. Furthermore, noting the short-lived nature of the species, the SWG MSE PS agreed that a shorter timeframe for achieving recovery would be appropriate. The SWG MSE PS also noted that, with a depleted stock, it is common practice at other regional fisheries management organizations (RFMOs) to set a high probability of achieving recovery. The SWG MSE PS agreed to give further consideration to the following objectives: 1. The stock status is recovered above B_{tar} within “xx” years with “pp” probability (for example, xx could be 2-5 and pp could be >80%); and 2. The stock status is maintained above the B_{tar} level over “yy-yy” years with “qq” probability.
20. Regarding avoiding unsustainable state of the stock, the SWG MSE PS agreed to give further consideration to the following two objectives: 1. The annual probability that the stock drops

below B_{lim} should not exceed “pp” probability; or 2. The annual probability that the fishing mortality exceeds F_{lim} should not exceed “pp” probability. The SWG MSE PS noted that if the objective for recovery is to be established based on B, setting the objective for sustainability based on F should be avoided because these two objectives may cause confusion.

21. Regarding achieving high and stable catch, the SWG MSE PS agreed to give further consideration to the following two objectives: 1. Catch is high and stable as much as possible; and 2. Maximum interannual variation of TAC over yy period should be less than xx%.
22. Regarding OMs, the SWG MSE PS considered Option A and Option B as described in NPFC-2022-SWG MSE PS01-WP01. The SWG MSE PS weighed the pros and cons of the two options and agreed to prioritize Option A (the use of the current interim stock assessment model, BSSPM, as a basis with consideration of uncertainties in estimated parameters and process errors) given the short timeframe available for achieving the short-term objectives of the SWG MSE PS TOR to develop an HCR. At the same time, the SWG MSE PS agreed that Option B (development of an age-structured model) is more scientifically comprehensive and could be considered as a potential additional model, if it is possible to develop such a model in time. The SWG MSE PS also noted that the BSSPM model in Option A has limited capability of predicting future biomass, and there is a need for improvement for evaluating interim HCRs.
23. The SWG MSE PS agreed to give further consideration to an empirical or model-based HCR. In the case of a model-based HCR, the following points need to be considered:
 - (a) Selection of an input of “B” for HCR (single recent year or 2- or 3-years average?);
 - (b) Maximum change in TAC over two consecutive years (within “xx” %);
 - (c) Parameters can be tuned to meet a priority objective over the reference scenarios;
 - (d) Frequency of application of HCR (every year considering the short-lived nature of the species and environmental concern?);
 - (e) Safeguards for exceptional circumstances.
24. The SWG MSE PS recognized the usefulness of the Shiny application and recommended the Commission allocate funds for the development of a simulation platform for the evaluation of HCR.

Agenda Item 5. Initial discussion toward development of management procedures (MPs) for the mid-term goal

5.1 Management objectives and some constraint conditions for the regulation of fishery

5.2 Technical matters on operating models, MPs, performance measures and simulation

25. The SWG MSE PS noted that, before it can hold detailed discussions about work towards its mid-term goal, there needs to be more progress on the development of a new age-structured stock assessment model that is better able to predict future biomass trends. The SWG MSE PS agreed to focus on its short-term goal until such progress is made and to defer discussions on its mid-term goal.
26. Pew suggested that the NPFC should work towards establishing an MSE process based on an ecosystem framework that takes into account environmental factors.

Agenda Item 6. Functioning within NPFC

6.1 Roles and scientific contributions from the SC and SSC PS

27. The SWG MSE PS reviewed the roles and expected scientific contributions from the SC and the SSC PS.

6.2 Roles and contributions from the TCC

28. The SWG MSE PS reviewed the roles and expected contributions from the TCC.

6.3 Others

29. The SWG MSE PS agreed to conduct intersessional technical work on developing a concrete proposal for reference points and management objectives and developing and evaluating HCRs as a short-term task (conditioning of OMs and listing up of possible/candidate HCRs).

Agenda Item 7. Other matters

7.1 Selection of an external expert

30. Dr. Kitakado suggested the selection of Dr. Larry Jacobson as the external expert for the development of the interim HCR, noting Dr. Jacobson's contributions to the work of the SSC PS.
31. The SWG MSE PS recommends the hiring of Dr. Larry Jacobson as the external expert for the development of the interim HCR.

7.2 Capacity building (glossary and demonstration)

32. The SWG MSE PS reviewed a glossary of terms for harvest strategies, management procedures and management strategy evaluation developed by the joint tuna RFMO (NPFC-2022-SWG MSE PS01-IP01) and requested that the Secretariat use this as a basis for developing the SWG MSE PS's own MSE glossary in cooperation with co-Chairs and Members.

33. Pew provided an overview of harveststrategies.org, an online resource with harvest-strategy-related material for fisheries scientists, managers, and other stakeholders (NPFC-2022-SWG MSE PS01-OP01).

7.3 Others

34. No other matters were discussed.

Agenda Item 8. Timeline and future process

8.1 Timeline

8.2 Future meetings

35. The SWG MSE PS discussed and drafted a timeframe for 2022 and early 2023 with proposed meetings and tasks (Annex D).

Agenda Item 9. Recommendations to the Commission

36. The SWG MSE PS01 recommends that the Commission:
- (a) Allocate funds for the development of a simulation platform for the evaluation of HCR.
 - (b) Hire Dr. Larry Jacobson as an external expert to support the development of an interim HCR.
 - (c) Endorse the timeframe for 2022 and early 2023 including the proposed meetings and tasks (Annex D).

Agenda Item 10. Adoption of report

37. The SWG MSE PS01 Report was adopted by consensus.

Agenda Item 11. Close of the Meeting

38. The meeting closed at 12:40 on 22 February 2022, Tokyo time.

Annex A – Agenda

Annex B – List of documents

Annex C – List of participants

Annex D – Proposed timeframe for 2022 and early 2023

Agenda

Agenda Item 1. Introductory items

- 1.1 Opening of the meeting
- 1.2 Adoption of agenda
- 1.3 Meeting logistics

Agenda Item 2. Role of the joint SWG MSE PS and review of the Terms of Reference

- 2.1 Commission's request and CMM 2021-08
- 2.2 Confirmation of NPFC priority on management
- 2.3 Review of the Terms of Reference

Agenda Item 3. General overview of an MSE process

- 3.1 Basic and general concept of MSE
- 3.2 Reference points, stock status and risks
- 3.3 Potential issues regarding MSE for Pacific saury (and small pelagic fish in general)

Agenda Item 4. Initial discussion toward development of an interim harvest control rule (HCR) for the short-term goal

- 4.1 Management objectives and some constraint conditions for the regulation of fishery
- 4.2 Technical matters on operating models, HCRs, performance measures and simulation

Agenda Item 5. Initial discussion toward development of management procedures (MPs) for the mid-term goal

- 5.1 Management objectives and some constraint conditions for the regulation of fishery
- 5.2 Technical matters on operating models, MPs, performance measures and simulation

Agenda Item 6. Functioning within NPFC

- 6.1 Roles and scientific contributions from the SC and SSC-PS
- 6.2 Roles and contributions from the TCC
- 6.3 Others

Agenda Item 7. Other matters

- 7.1 Selection of an external expert
- 7.2 Capacity building (glossary and demonstration)

7.3 Others

Agenda Item 8. Timeline and future process

8.1 Timeline

8.2 Future meetings

Agenda Item 9. Recommendations to the Commission

Agenda Item 10. Adoption of report

Agenda Item 11. Close of the meeting

List of Documents**MEETING INFORMATION PAPERS**

Symbol	Title
NPFC-2022-SWG MSE PS01-MIP01	Meeting Information
NPFC-2022-SWG MSE PS01-MIP02	Provisional Agenda
NPFC-2022-SWG MSE PS01-MIP03 (Rev. 1)	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Symbol	Title
NPFC-2019-WS BRP_HCR_MSE01-WP01 (Rev. 1)	Review of Target and Limit Reference Points
NPFC-2019-WS BRP_HCR_MSE01-Final Report	Biological Reference Point/Harvest Control Rule/Management Strategy Evaluation Workshop Report
	Conservation and Management Measure 2021-08 for Pacific Saury
	TOR for a joint SC-TCC-COM SWG MSE PS

WORKING PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS01-WP01	Development of HCR for Pacific saury for meeting the short-term objective set in the Terms of Reference of the SWG MSE PS

INFORMATION PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS01-IP01	Glossary of terms for harvest strategies, management procedures and management strategy evaluation
NPFC-2022-SWG MSE PS01-IP02	Proposed timeframe for 2022 and early 2023

OBSERVER PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS01-OP01	Harvest Strategies

List of Participants

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Proposed timeframe for 2022 and early 2023

Meeting	Date	Task
SWG MSE PS01 (virtual)	Feb 21-22, 2022	<ul style="list-style-type: none"> Objectives, timeline and workplan Plans for intersessional technical work
COM07 (virtual)	Mar 28-30, 2022	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS01 report
Intersessional technical work		<ul style="list-style-type: none"> Develop a concrete proposal of reference points and management objectives Start technical work for developing and evaluating HCRs as a short-term task (conditioning of OMs and list up possible/candidate HCRs)
SSC PS09	Aug 30-Sep 2, 2022	<ul style="list-style-type: none"> Review standardized CPUE up to 2021 Review Japanese survey estimates including 2022 Review progress on new assessment models and finalize a set of models and specification Start discussion on development and evaluation of HCR as a short-term task
SWG MSE PS02	Sep 12-13, 2022	<ul style="list-style-type: none"> Feedback on outcomes of intersessional work Capacity building
Intersessional technical work		<ul style="list-style-type: none"> Continue discussions on reference points and management objectives and technical work for developing and evaluating HCRs as a short-term task
SSC PS10	Dec 12-15, 2022	<ul style="list-style-type: none"> Update BSSPM analyses and provide recommendations to the SC/COM Review progress on new assessment models and finalize a set of models and specification (relevant to the mid-term MSE work as conditioning of operating models) Continue discussion on development and evaluation of HCR as a short-term task
SWG MSE PS03	Around one month prior to COM08	<ul style="list-style-type: none"> Objectives, reference points, timeline and workplan Recommendations to the Commission
COM08	2023	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS 02 and 03 reports
To be determined	2023	

Note: Meetings highlighted in yellow are those that have already been scheduled.



Annex S: SWG MSE PS02 Report

North Pacific Fisheries Commission

NPFC-2022-SWG MSE PS02-Final Report

**2nd Meeting of the Joint SC-TCC-COM Small Working Group on
Management Strategy Evaluation for Pacific Saury (SWG MSE PS)
REPORT**

12 - 13 September 2022

October 2022

This paper may be cited in the following manner:

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North Pacific Fisheries Commission
2nd Meeting of the Joint SC-TCC-COM Small Working Group on
Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

12 - 13 September 2022

WebEx

REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 2nd meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Larry Jacobson participated as an invited expert. The meeting was chaired by Dr. Toshihide Kitakado (Japan) who is the co-Chair of the SWG MSE PS. Dr. Kitakado opened the meeting and welcomed the participants.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.
4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

2.1 SWG MSE PS01

5. The Chair presented the outcomes and recommendations from the SWG MSE PS01 meeting (NPFC-2022-SWG MSE PS02-IP01).

2.2 SSC PS09

6. The Chair presented the outcomes and recommendations from the 1st Intersessional Meeting of

the Small Scientific Committee on Pacific Saury (SSC PSint01; NPFC-2022-SWG MSE PS02-WP01) and the 9th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS09).

Agenda Item 3. Development of an interim harvest control rule (HCR) as a short-term task

7. The SWG MSE PS noted that the provisions of Article 3(b) and 3(c) of the Convention and paragraph 7, Annex II, of the 1995 United Nations Fish Stock Agreement provide a framework for discussions of the HCR and MSE, specifically that management measures shall ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield (MSY), that measures shall be based on a precautionary approach, and that the fishing mortality rate which generates MSY should be regarded as a minimum standard for limit reference points.

3.1 Management objectives

8. The SWG MSE PS reviewed the three types of management objective discussed at SWG MSE PS01: recovery of the stock, avoiding unsustainable state of the stock, and achieving high and stable catch. The SWG MSE PS agreed to continue to base discussions around these three objectives below, putting higher priority on (a);
 - (a) Recovery of the stock:
 - i. The stock status is recovered above B_{tar} within “xx” years with “pp” probability (for example, xx could be 2-5 and pp could be >80%);
 - ii. The stock status is maintained above the B_{tar} level over “yy-yy” years with “qq” probability.
 - (b) Avoiding unsustainable state of the stock:
 - i. The annual probability that the stock drops below B_{lim} should not exceed “pp” probability;
 - ii. The annual probability that the fishing mortality exceeds F_{lim} should not exceed “pp” probability.
 - (c) Achieving high and stable catch:
 - i. Catch is high and stable as much as possible;
 - ii. Maximum interannual variation of TAC over yy period should be less than xx%.

3.2 Reference points and tuning criteria

9. The SWG MSE PS considered the list of preliminary reference points discussed at the SSC PSint01 and developed it further, as shown below. The SWG MSE PS agreed that the list of ranges for biological reference points contains typical values but is purposely wide for computational, discussion and exploratory purposes. The default values are for demonstration purposes. Neither implies any advice or decision about recommended harvest guidelines for

Pacific saury.

Reference point	Default value	Potential range
$B_{tar} = c * B_{MSY}$	$c = 1$	$c = 0.8 - 1.2$
$B_{lim} = c * B_{MSY}$	$c = 0.35$	$c = 0.2 - 0.5$
$F_{tar} = c * F_{MSY}$	$c = 1$	$c = 0.8 - 1.2$
$F_{lim} = c * F_{MSY}$	$c = 1.35$	$c = 1.2 - 1.5$

3.3 Conditioning of operating models (OMs)

10. The SWG MSE PS noted the previous discussions on the conditioning of OMs in the SWG MSE PS01 and the SSC PSint01 and agreed to continue this work.

3.4 Listing up possible/candidate HCRs and constraints therein

11. The SWG MSE PS considered the three HCR options discussed at the SSC PSint01 and developed them further, together with implementation schedules, as described in Annex D. The SWG MSE PS agreed to continue to develop the HCR options, while indicating initial preference for Option 2.
12. Two of the HCR options (Options 2 and 3) would allow for the adjustment of the total allowable catch (TAC) based on the stock assessment result one year ago during the fishing season. The SWG MSE PS noted that being able to make such an adjustment is important in light of the biological characteristics of Pacific saury, namely its short lifespan and interannual fluctuation in recruitment strength. At the same time, the SWG MSE PS noted that a mid-season TAC adjustment could be challenging for managers and industry, and that various options, such as constraints on the level of adjustment or limiting the making of adjustments only to exceptional circumstances, should be considered. The SWG MSE PS noted that it is essential for such discussions to be held among scientists and managers, and encouraged both Member scientists and managers to attend future meetings.

3.5 Performance measures

13. The SWG MSE PS reviewed the performance measures discussed at the SWG MSE PS01 and agreed to continue to base discussions around them. The possible performance measures reflecting the management objectives are as follows:
- (a) Recovery of the stock:
- i. Probabilities that the stock status is above B_{tar} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented;
 - ii. Probabilities that the stock status is in Kobe green quadrant at 5, 10, 15 years after the

HCR is implemented.

- (b) Avoiding unsustainable state of the stock:
 - i. Probabilities that the stock status is below B_{lim} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented;
 - ii. Probabilities that the fishing mortality exceeds F_{lim} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented.
- (c) Achieving high and stable catch:
 - i. Average catch by 1-5, 6-10, 11-15 years after the HCR is implemented;
 - ii. Annual catch variation by 5, 10, 15 years after the HCR is implemented;
 - iii. Probabilities that the TAC hits the predetermined maximum change by 5, 10, 15 years after the HCR is implemented.

3.6 Simulation platform

- 14. The SWG MSE PS reaffirmed the usefulness of the Shiny application and recommended that the Commission ensure the adequate allocation of funds, as soon as possible, for the development of a simulation platform for the evaluation of HCR. Funding for support of HCR analyses by the SSC PS may be required as well.
- 15. The SWG MSE PS noted that the seasonal pattern of catches should be considered in testing potential adjustments to quotas in year t set in year $t-1$. Under Option 2, survey and preliminary CPUE data for year t would become available for use in adjustments at the first assessment meeting in August when the survey data become available. This implies that managers might adjust the TAC in late August or early September. A cursory examination showed that seasonal patterns in catch vary between Members and years. The fraction of total seasonal catch by August or September may be considerable in some years, limiting the Commission's ability to reduce catch in some cases. There are three technical points to note with respect to seasonal catch patterns in HCR simulation analyses under Option 2:
 - (a) Seasonal catch patterns may generally affect the efficacy of adjustment procedures.
 - (b) Efficacy may vary from year to year.
 - (c) If seasonal patterns are deemed important, they might be simulated based on observed patterns and able to account for possible implementation errors.

3.7 Template for presentation of results

- 16. The SWG MSE PS agreed to defer the development of a template for the presentation of results to its next meeting.

3.8 Other matters

17. No other matters were discussed.

Agenda Item 4. Initial discussion toward development of management procedures (MPs) for the mid-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

18. The SWG MSE PS agreed to focus on its short-term goal until sufficient progress is made and to defer discussions on its mid-term goal.

19. The SWG MSE PS noted that efforts should be made to ensure as smooth a transition as possible from the short-term goal when setting the HCR to the mid-term goal when developing the MPs.

20. The SWG MSE PS noted Pew's suggestion that the NPFC should work toward establishing an MSE process based on an ecosystem framework that takes into account environmental factors.

4.2 Technical matters on operating models, MPs, performance measures and simulation

21. The SWG MSE PS reaffirmed that it will continue to work to develop an age-structured stock assessment model, without going into technical details.

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

5.1 Implementation schedule of an HCR

22. The implementation schedules for the three HCR options are described in Annex D.

23. The SWG MSE PS agreed to analyze a relatively limited range of simple HCRs used in other fisheries. These approaches use an F_{MSY} proxy applied at high biomass levels and a single $B_{threshold}$ value to reduce F as biomass approaches zero. The F_{MSY} proxy approach reduces the need for difficult policy decisions because it is generally recognized that healthy stocks can be fished at maximum sustainable levels, particularly if F is reduced as biomass declines to relatively low levels. The Commission's decision regarding $B_{threshold}$ levels must be based on policy and scientific considerations including simulation results. However, the analyses and range of options considered can be guided and reduced using precedents in other fisheries. This approach recognizes the need to implement an improved approach for Pacific saury in the near term (1-2 years) and it will be possible to improve it later. A simple approach is expected to perform relatively well.

24. The SWG MSE PS agreed that the short 2-year lifespan of Pacific saury and the assessment cycle with one-year delay are expected to reduce HCR performance. To overcome this point,

the SWG MSE PS considered Options 2 & 3, which could modify the quota in year t (originally set in year t-1) with survey and preliminary data from the current year. This is an important but potentially difficult task complicated by scientific and management cycles, and data availability. Nevertheless, the SWG MSE PS agreed to concurrently estimate the potential performance gains from in-season adjustments under Options 2 and 3 and provide concrete proposals. Meanwhile, the SWG MSE PS will also consider the administrative and procedural requirements for in-season adjustments.

25. The SWG MSE PS requested the SSC PS to conduct the technical work in relation to developing the HCR and MPs.

5.2 Mid-term plan of implementation and its review process

26. The SWG MSE PS noted that normally after the completion of HCR and MPs, reviews are conducted within the timeframe of two to three years, but considering the nature of Pacific saury, regular review might be warranted at the beginning of this time period.

5.3 Definition of exceptional circumstances

27. The SWG MSE PS noted that exceptional circumstances can be the population dynamics falling beyond the range of the confidence interval and the unavailability of fisheries independent surveys.

28. The SWG MSE PS noted that the finalized HCR should include definitions of exceptional circumstances.

Agenda Item 6. Other matters

6.1 Capacity building

29. The SWG MSE PS agreed to defer discussions on capacity building to its next meeting.
30. The SWG MSE PS suggested that being able to hold in-person meetings would facilitate more effective hands-on capacity building.

6.2 Others

31. No other matters were discussed.

Agenda Item 7. Timeline and future process

7.1 Timeline

32. The SWG MSE PS reviewed and revised the timeframe agreed to at SWG MSE PS01 (Annex

F).

7.2 Future process with assistance of SSC PS

7.3 Workplan till SWG MSE PS03 meeting

33. The SWG MSE PS recommended that its next meeting be held in person, if possible, and be funded by the Commission if needed.

Agenda Item 8. Recommendations to the Commission

34. The SWG MSE PS02 recommends that:

- (a) the Commission ensure the adequate allocation of funds for the development and utilization of a simulation platform for the evaluation of HCR.
- (b) the next SWG MSE PS meeting be held in person, back-to-back with the annual Commission meeting, and be funded by the Commission if needed.
- (c) the Commission endorse the timeframe for 2024 including the proposed meetings and tasks (Annex F).

35. The SWG MSE PS requested the Secretariat to include the above funding requests in the revised 2022 budget for presentation at the Special Commission meeting on 18 October 2022.

36. The SWG MSE PS agreed that future meetings should include both scientists and managers to facilitate communication and completion of this important work.

Agenda Item 9. Adoption of report

37. The SWG MSE PS02 Report was adopted by consensus.

Agenda Item 10. Close of the Meeting

38. The meeting closed at 12:55 on 13 September 2022, Tokyo time.

Annex A – Agenda

Annex B – List of documents

Annex C – List of participants

Annex D – Proposed options of Harvest Control Rules

Annex E – Timeframe of NPFC meetings toward setting a Harvest Control Rule

Annex F – Timeline and tasks

Agenda

Agenda Item 1. Introductory items

- 1.1 Opening of the meeting
- 1.2 Adoption of agenda
- 1.3 Meeting logistics

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

- 2.1 SWG MSE PS01
- 2.2 SSC PS09

Agenda Item 3. Development of an interim harvest control rule (HCR) as a short-term task

- 3.1 Management objectives
- 3.2 Reference points and tuning criteria
- 3.3 Conditioning of operating models (OMs)
- 3.4 Listing up possible/candidate HCRs and constraints therein
- 3.5 Performance measures
- 3.6 Simulation platform
- 3.7 Template for presentation of results
- 3.8 Other matters

Agenda Item 4. Initial discussion toward development of management procedures (MPs) as a mid-term goal

- 4.1 Management objectives and some constraint conditions for the regulation of fishery
- 4.2 Technical matters on operating models, MPs, performance measures and simulation

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

- 5.1 Implementation schedule of an HCR
- 5.2 Mid-term plan of implementation and its review process
- 5.3 Definition of exceptional circumstances

Agenda Item 6. Other matters

- 6.1 Capacity building
- 6.2 Others

Agenda Item 7. Timeline and future process

- 7.1 Timeline

7.2 Future process with assistance of SSC PS

7.3 Workplan till SWG MSE PS03 meeting

Agenda Item 8. Recommendations to the Commission

Agenda Item 9. Adoption of report

Agenda Item 10. Close of the meeting

List of Documents**MEETING INFORMATION PAPERS**

Symbol	Title
NPFC-2022-SSC PS09-MIP01	Meeting Information
NPFC-2022-SWG MSE PS02-MIP02	Provisional Agenda
NPFC-2022-SWG MSE PS02-MIP03 (Rev. 1)	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Symbol	Title
NPFC-2022-SSC PS09-Report	Draft report of SSC PS09
NPFC-2022-SWG MSE PS01-Final Report	1st Meeting of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) Report

WORKING PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS01-WP01	Meeting Summary of the 1st intersessional meeting of the SSC PS in 2022

INFORMATION PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS02-IP01	Co-Chair's presentation from SWG MSE PS01

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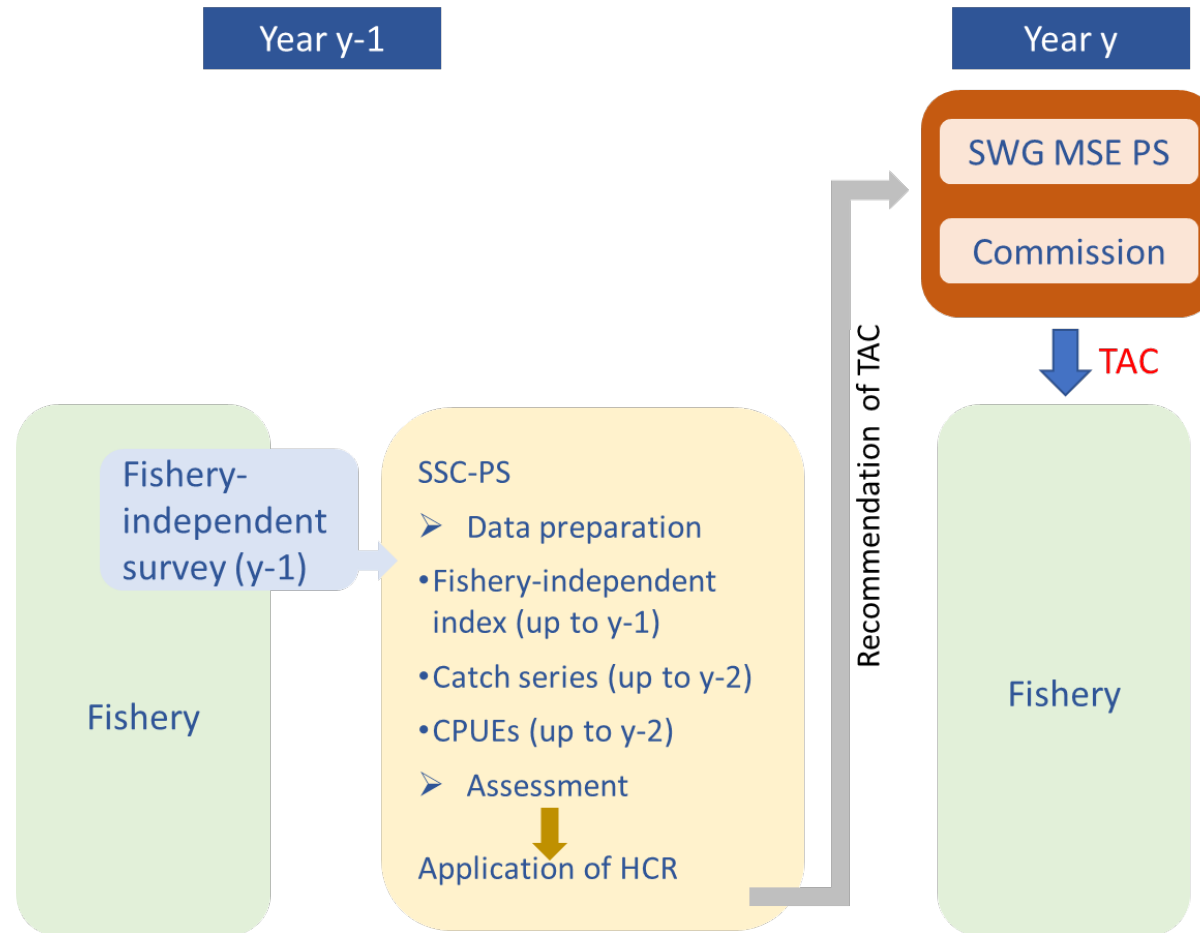
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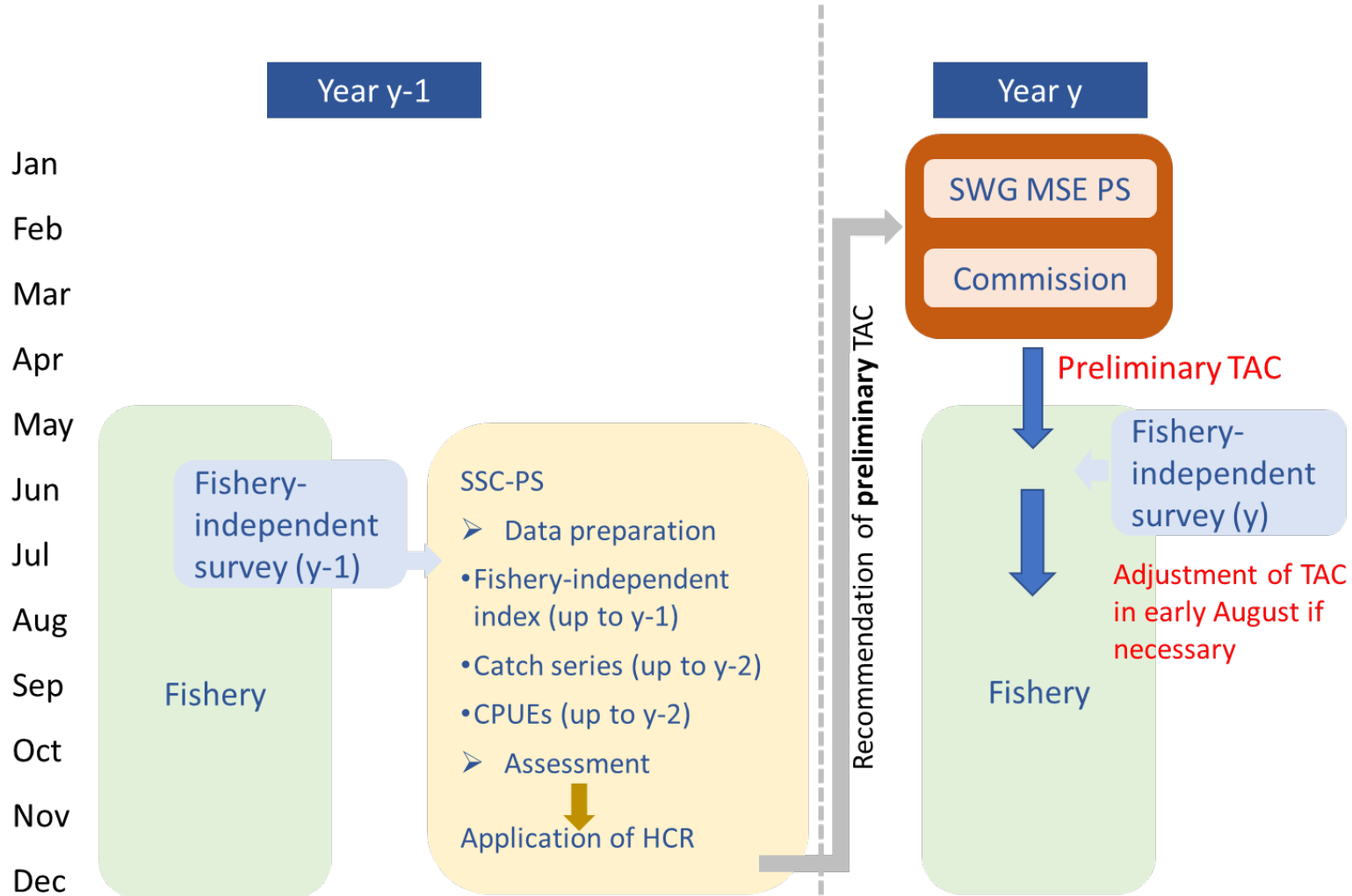
Mervin OGAWA
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Proposed options of Harvest Control Rules

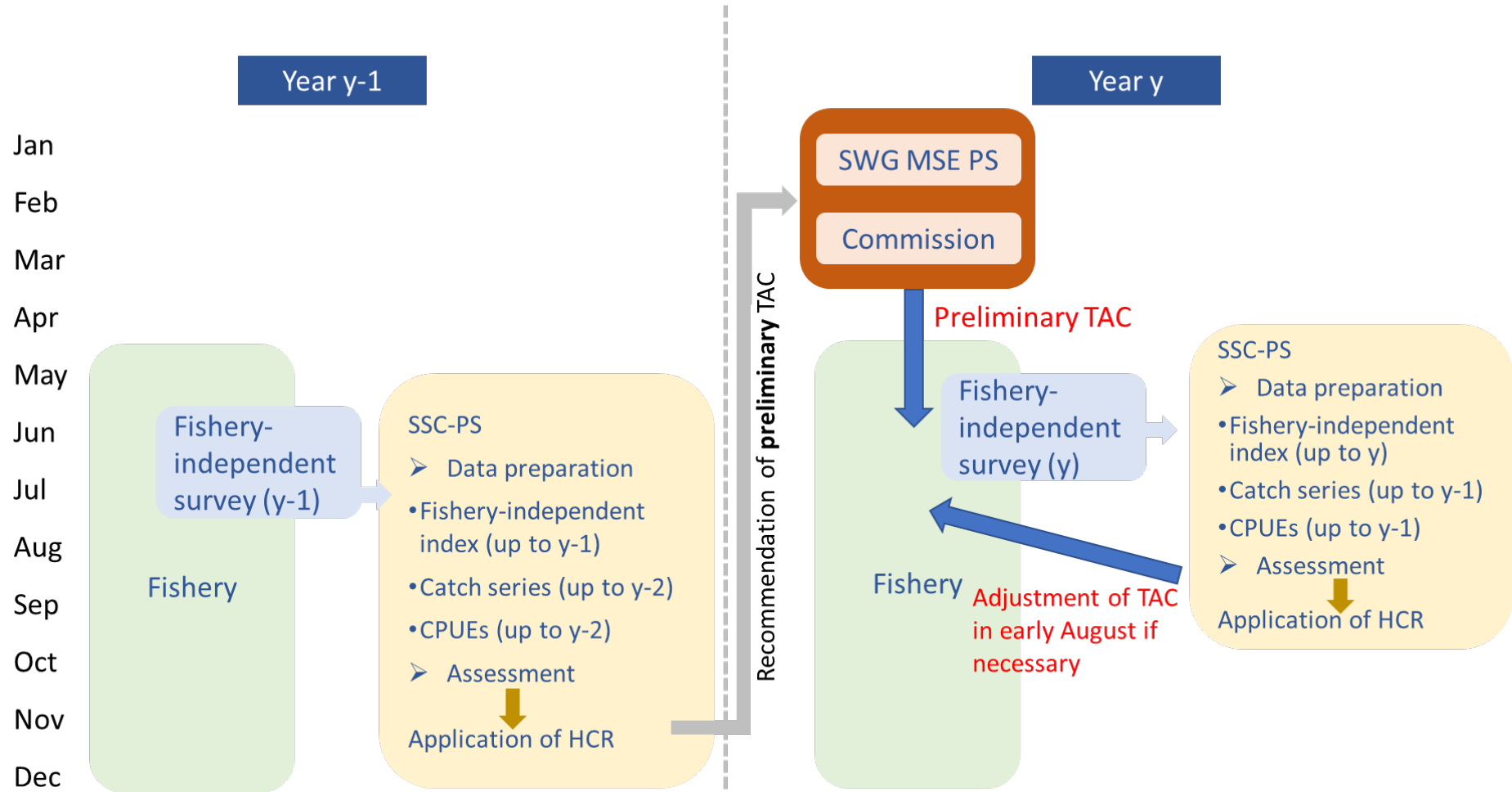
HCR1 (setting TAC based on previous year's assessment)



HCR2 (Hybrid approach with new index)

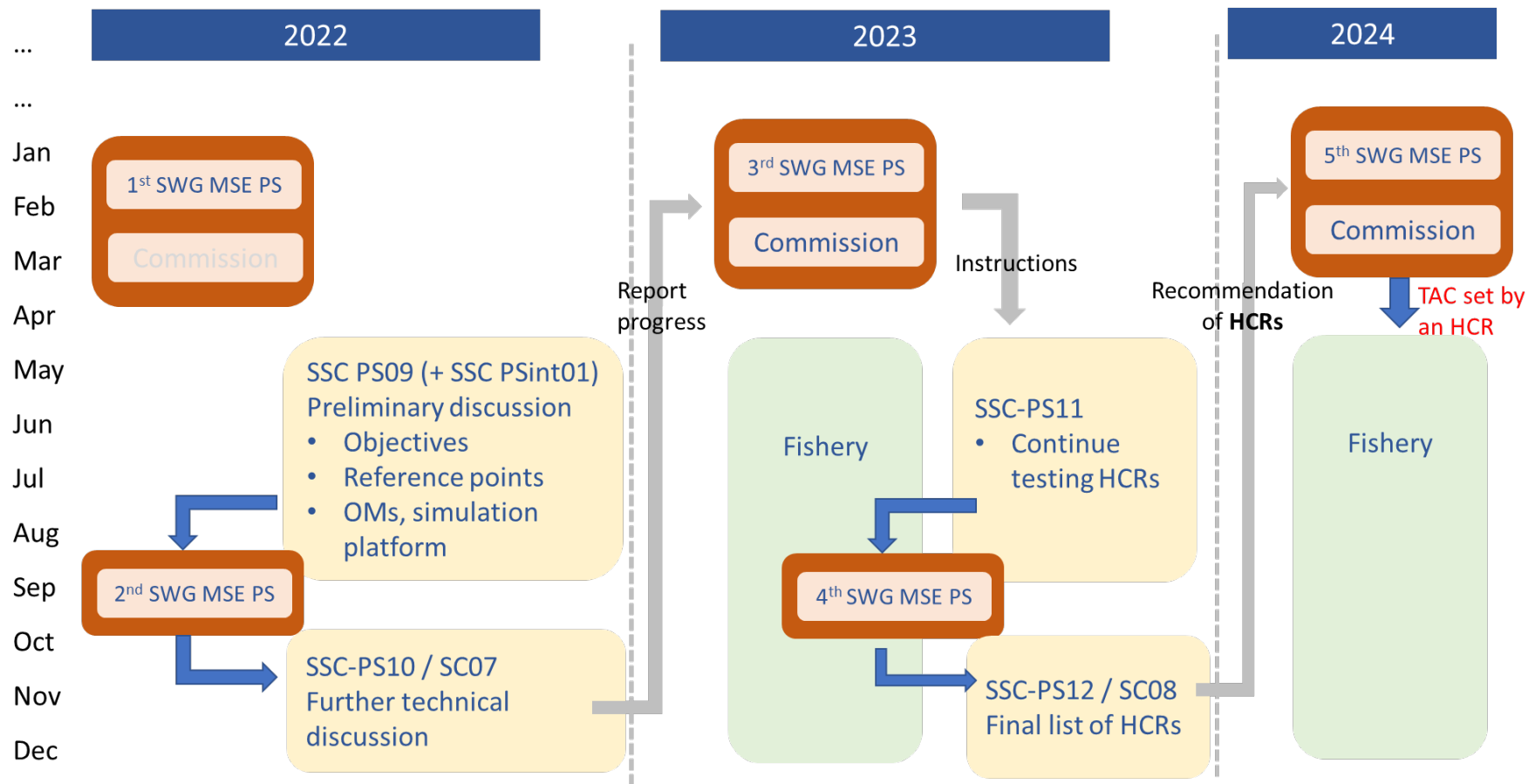


HCR3 (Hybrid approach with new assessment)



Timeframe of NPFC meetings toward setting a Harvest Control Rule

Implementation schedule



Timeline and tasks

Meeting	Date	Task
SWG MSE PS01	Feb 21-22, 2022	<ul style="list-style-type: none"> Objectives, timeline and workplan Establishment of a (small) Task Force for technical works?
COM07 (postponed)	(Mar 28-30, 2022)	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS01 report
Intersessional technical work		<ul style="list-style-type: none"> Develop concrete proposal of reference points and management objectives Start technical work for developing and evaluating HCRs as a short-term task (conditioning of OMs and list up possible/candidate HCRs)
SSC PS09	Aug 30-Sep 2, 2022	<ul style="list-style-type: none"> Review standardized CPUE up to 2021 Review Japanese survey estimates incl. 2022 Review progress on new assessment models and finalize a set of models and specification Start discussion on development and evaluation of HCR as a short-term task
SWG MSE PS02	Sep 12-13, 2022	<ul style="list-style-type: none"> Feedback on outcomes of intersessional work Capacity building
Intersessional technical work		<ul style="list-style-type: none"> Continue discussions on “reference points and management objectives” and technical work for developing and evaluating HCRs as a short-term task
SSC PS10	Dec 12-15, 2022	<ul style="list-style-type: none"> Update BSSPM analyses and provide recommendations to the SC/COM Review progress on new assessment models and finalize a set of models and specification (relevant to the mid-term MSE work as conditioning of operating models) Continue discussion on development and evaluation of HCR as a short-term task
SWG MSE PS03	Prior to COM08	<ul style="list-style-type: none"> Objectives, reference points, timeline and workplan Continue discussion and dialogue between managers, scientists and stakeholders Provide feedback to SSC PS
COM07	2023	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS 02 and 03 reports
To be determined	2023	



Annex T: SWG MSE PS03 Report

North Pacific Fisheries Commission

NPFC-2023-SWG MSE PS03-Final Report

**3rd Meeting of the Joint SC-TCC-COM Small Working Group on
Management Strategy Evaluation for Pacific Saury (SWG MSE PS)
REPORT**

28 February – 1 March 2023

March 2023

This paper may be cited in the following manner:

Small Working Group on Management Strategy Evaluation for Pacific Saury. 2023. 3rd Meeting Report. NPFC-2023-SWG MSE PS03-Final Report. 16 pp. (Available at www.npfc.int)

North Pacific Fisheries Commission
3rd Meeting of the Joint SC-TCC-COM Small Working Group on Management
Strategy Evaluation for Pacific Saury (SWG MSE PS)

28 February – 1 March 2023

WebEx

REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 3rd meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, the European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. The Pew Charitable Trusts (Pew) and the World Wildlife Fund attended as observers. Dr. Larry Jacobson participated as an invited expert. The meeting was chaired by Dr. Toshihide Kitakado (Japan) who is the co-Chair of the SWG MSE PS. Dr. Kitakado opened the meeting and welcomed the participants.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.
4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

2.1 SWG MSE PS02

5. The Chair presented the outcomes and recommendations from the SWG MSE PS02 meeting (NPFC-2023-SWG MSE PS03-WP01).
6. With regard to HCR options that would allow for in-season adjustment of the total allowable catch (TAC), the invited expert pointed out the possibility that simulations may overstate the performance of these HCRs if a significant amount of time is required between the

identification of a circumstance requiring an in-season adjustment and the implementation of the Commission's response.

2.2 *SSC PS10*

7. The Chair presented the outcomes and recommendations from the 10th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS10; NPFC-2023-SWG MSE PS03-WP01).
8. The SWG MSE PS discussed the issues with using BSSPM model projections. Besides the problems that the SSC PS has previously noted, the Chair cautioned that the current operating model (OM) based on BSSPM may provide optimistic projections for a stock starting at a low biomass level in the absence of current information about stock status as demonstrated in projection analysis for stock assessments and because random process errors in simulations do not provide information about directional changes. China agreed that such simple projections are somewhat unreliable but pointed out that a small recovery trend in the Pacific saury stock has been observed in the latest few years. These observations resulted in substantial discussion among the participants and efforts to model process errors in a realistic manner.
9. Japan expressed concern about the current stock status of Pacific saury, pointing out that biomass and catch are at historically lowest levels. Japan further pointed out that the situation surrounding the Pacific saury fishery has changed significantly over time, such as more fishing being conducted in the high seas, increased size of fishing vessels, advances in fishing-related technologies, and more frequent at-sea transfers, and questioned whether some Members' calculations of CPUE, which are based on days rather than hauls, fully capture catchability or effort.
10. China pointed out that, according to the Annual Summary Footprint for Pacific saury, the number of some Members' fishing vessels has increased in the high seas over the years, while that for some other Members has been stable following the relevant Articles of CMM for Pacific saury. China further pointed out that the SSC PS has agreed on the need to study environmental effects and understand the relative impact of the environment on Pacific saury population dynamics. China highlighted the importance of this work and called for it to be accelerated.
11. The SWG MSE PS agreed to request the SSC PS to hold technical discussions on improving the quality of CPUE indices.

Agenda Item 3. Review progress on development of an interim harvest control rule (HCR) as a short-term task

12. The Chair presented a preliminary demonstration with the Shiny application to evaluate the performance of several HCRs (NPFC-2023-SWG MSE PS03-WP01).

13. The SWG MSE PS noted that the three HCR options show recovery in a short time period. This may be due to BSSPM's optimistic and slightly unrealistic assumption of the high potential of recovery, which is in part because the unfavorable conditions of recent years have not been considered. The SWG MSE PS also noted that the three HCRs (HCR0: $F_{MSY} * B$, HCR1: a usual hockey-stick type of HCR, and HCR3: a hybrid version of HCR1 with an in-season adjustment based on Japanese fishery-independent survey) show different speeds of recovery between HCR0 and HCR1/HCR3 showing an increased chance of the population recovering in a shorter time period for HCR1/HCR3. The SWG MSE PS further noted that the HCR parameters of the three options are preliminary and could be tuned based on further discussion.

3.1 Management objectives

3.2 Reference points and tuning criteria

14. The SWG MSE PS reviewed and updated the three types of management objectives discussed at SWG MSE PS01 and SWG MSE PS02. The SWG MSE PS agreed to continue discussions around these three objectives below, putting higher priority on (a).
- (a) Recovery of the stock:
- i. The stock status is recovered above $B_{tar} = B_{MSY}$ within "xx" years with "pp" probability (for example, xx could be xx=4-6 and "pp" could be pp=60-80%);
 - ii. The stock status is maintained above the B_{tar} level over "yy-yy" years with "pp" probability.
- (b) Avoiding unsustainable state of the stock:
- i. The annual probability that the stock drops below B_{lim} should not exceed "pp" probability;
 - ii. The annual probability that the fishing mortality exceeds F_{lim} should not exceed "pp" probability.
- (c) Achieving high and stable catch:
- i. Catch is high and stable as much as possible;
 - ii. Maximum interannual variation of TAC over "yy-yy" period should be less than 40%.
15. With regard to the maximum interannual variation of TAC, depending on the simulation results, the SWG MSE PS discussed the possibility of limiting this to 20 or 25% if the TAC is set based on an average of multiple years.
16. The SWG MSE PS reviewed the list of preliminary reference points discussed at the SSC PSint01 and SWG MSE PS02. The SWG MSE PS reaffirmed that the list of ranges for biological reference points generally contains typical values, although $1 * F_{MSY}$ may be more appropriate as F_{lim} rather than F_{tar} . Regardless, the range is purposely wide for computational, discussion and exploratory purposes. The default values are for demonstration purposes.

Neither implies any advice or decision about recommended harvest guidelines for Pacific saury.

Reference point	Default value	Potential range
$B_{tar} = c * B_{MSY}$	$c = 1$	$c = 0.8 - 1.2$
$B_{lim} = c * B_{MSY}$	$c = 0.35$	$c = 0.2 - 0.5$
$F_{tar} = c * F_{MSY}$	$c = 1$	$c = 0.8 - 1.2$
$F_{lim} = c * F_{MSY}$	$c = 1.35$	$c = 1.2 - 1.5$

17. The SWG MSE PS noted that the current OM shows a somewhat optimistic recovery process for the reasons identified in paragraph 8, and further development of process error assumptions in the model is needed to make “pp” and “time frame” calculations, as indicated in objective (a) in paragraph 14, more realistic.
18. The SWG MSE PS agreed to continue to look at different combinations of HCR parameters, such as setting the overall discount rate to F_{MSY} .

3.3 Conditioning of operating models (OMs)

19. The SWG MSE PS noted the previous discussions on the conditioning of OMs in the SWG MSE PS01, SSC PSint01, and the SWG MSE PS02 meetings.
20. The SWG MSE PS agreed that Option A is to be used as the default option. However, it also noted that, since the current assumptions, which do not account for environmental effects, are somewhat optimistic for population recovery, there is an urgent need to extend the current OM with BSSPM by incorporating environmental information.
21. The SWG MSE PS noted that a great deal of uncertainty exists regarding the environmental factors driving variability in Pacific saury. It is therefore important that recommended HCR options are robust and perform well under a range of assumptions. The SWG MSE PS therefore agreed to structure its testing analyses around a range of hypotheses including:
 - (a) Long-term climate change over next 10-15 years (some reasonable, but not necessarily perfect, patterns to be developed);
 - (b) Short-term change over 5 years;
 - (c) Random (constant mean) but high variation.
22. The SWG MSE PS agreed to also continue development of age-structured models so that it may be used to condition a set of OMs if feasible.

3.4 Candidate HCRs and constraints therein

23. The SWG MSE PS considered the candidate HCRs and the constraints therein and agreed on the need to hold further discussions on the following:
- (a) Choice of an input value of “B” for HCR (average of recent 2 years as a default, and single recent year for trial since this option may be used for HCR2 and HCR3 with some in-season adjustment);
 - (b) Maximum allowable change in TAC over two consecutive years (within 40%, but 20-25% when the value of B is based on the average of two years);
 - (c) HCR parameters can be tuned to meet a higher priority objective. To do so, however, more concrete and specific objectives need to be set.
24. The SWG MSE PS noted the need to confirm the feasibility of HCR2 and HCR3 with in-fishing season adjustment of TACs. One possible way is to set a preliminary and precautionary TAC, and increase it when a good sign of abundance is detected in the Japanese fishery-independent survey. The SWG MSE PS also discussed the possibility of setting a trigger level for determining if the TAC should be adjusted or not.
25. The SWG MSE PS agreed to use $HCR = \text{Recent } F \text{ (such as recent three-year average)} * B$ for demonstration purposes.

3.5 Performance measures

26. The SWG MSE PS reviewed the performance measures discussed at SWG MSE PS01 and SWG MSE PS02 and agreed to continue to base discussions around them. The possible performance measures reflecting the management objectives are as follows:
- (a) Recovery of the stock:
 - i. Probabilities that the stock status is above B_{tar} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented;
 - ii. Probabilities that the stock status is in Kobe green quadrant at 5, 10, 15 years after the HCR is implemented.
 - (b) Avoiding unsustainable state of the stock:
 - i. Probabilities that the stock status is below B_{lim} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented;
 - ii. Probabilities that the fishing mortality exceeds F_{lim} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented.
 - (c) Achieving high and stable catch:
 - i. Average catch by 1-5, 6-10, 11-15 years after the HCR is implemented;
 - ii. Annual catch variation by 5, 10, 15 years after the HCR is implemented;
 - iii. Probabilities that the TAC hits the predetermined maximum change by 5, 10, 15 years after the HCR is implemented.

27. The SWG MSE PS noted that, in addition, the first calculated TAC by HCRs will also need to be presented.

3.6 Simulation platform

28. The Chair reported on progress in the development of the Shiny application.
29. At the request of the SWG MSE PS, the Chair agreed to share the code for the Shiny application for interested participants to use. The Chair explained that the Shiny application was primarily for the convenience of Members, and it is currently conditioned based on the 2022 stock assessment. However, the Chair may conduct final calculations using the same code without the Shiny interface and include information from the 2023 stock assessment, which may provide different results.
30. The invited expert also recommended that the Shiny application output include metadata (e.g. date, settings, etc.) when simulations are run.

3.7 Template for presentation of results

31. The SWG MSE PS agreed to defer the finalization of a template for the presentation of results to its next meeting.

3.8 Other matters

32. No other matters were discussed.

Agenda Item 4. Discussion toward the development of management procedures (MPs) as a mid-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

33. The SWG MSE PS agreed to focus on its short-term goal until sufficient progress is made and to defer discussions on its mid-term goal.
34. The SWG MSE PS reaffirmed the need to ensure as smooth a transition as possible from the short-term goal when setting the HCR to the mid-term goal when developing the MPs.

4.2 Technical matters on operating models, MPs, performance measures and simulation

35. The SWG MSE PS tasked the SSC PS to continue to work to develop an age-structured stock assessment model, without going into technical details. This will contribute to the more comprehensive MSE framework that will be used to develop the long-term MP.

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

5.1 Implementation schedule of an HCR

36. The SWG MSE PS reviewed the implementation schedules for the three HCR options agreed to at the SWG MSE PS02 meeting and agreed that the HCR to be selected at COM08 should be recommended for use in setting the 2024 TAC (Annex D).

5.2 Mid-term plan of implementation and its review process

37. The SWG MSE PS reaffirmed that normally after the completion of HCR and MPs, reviews are conducted within the timeframe of two to three years, but considering the nature of Pacific saury, regular review might be warranted at the beginning of this time period.

5.3 Definition of exceptional circumstances

38. The SWG MSE PS reaffirmed that the exceptional circumstances can be the population dynamics falling beyond the range of the confidence interval and the unavailability of fisheries independent surveys.
39. The SWG MSE PS reaffirmed that the finalized HCR should include definitions of exceptional circumstances.

Agenda Item 6. Other matters

6.1 Selection of co-Chair

40. The Science Manager explained that the position of co-Chair of the SWG MSE PS representing the Technical and Compliance Committee (TCC) is currently vacant and invited nominations from Members.
41. As there were no nominations, the SWG MSE PS agreed to request the Commission to appoint a co-Chair.

Agenda Item 7. Timeline and future process

7.1 Timeline

42. The SWG MSE PS reviewed and revised the timeframe agreed to at SWG MSE PS02 (Annex E).

7.2 Future process with assistance of SSC PS

43. The SWG MSE PS compiled a list of technical tasks requiring the assistance of the SSC PS and potentially the assistance of the Commission:
- (a) Review CPUE indices (including joint CPUE) for possible improvement (see paragraphs 9 and 10)
 - (b) Review BSSPM in light of handling of process error and environmental changes (bias correction, auto-correlation, fluctuation etc.)
 - (c) Develop some working hypotheses for some OMs to test robustness of HCRs

- (d) Test the performance of one-year biomass estimate or two-year average
- (e) Test the performance over different constraints
- (f) Run simulation with several combination of HCR parameters
- (g) Run simulation separately over OM scenarios

7.3 Workplan till SWG MSE PS04 meeting

44. The SWG MSE PS developed a workplan of intersessional activities until the 5th SWG MSE PS meeting (Annex E).

Agenda Item 8. Recommendations to the Commission

45. The SWG MSE PS recommends that:

- (a) the Commission ensure the adequate allocation of funds for the continued development and utilization of a simulation platform for the evaluation of HCR if needed.
- (b) the SWG MSE PS04 and 05 meetings be held in person, with a hybrid option, and be funded by the Commission if needed.
- (c) the invited expert, Dr. Larry Jacobson, be invited to the next SWG MSE PS meetings.
- (d) the Commission endorse the timeframe through 2024 including the proposed meetings and tasks (Annex E).
- (e) the Commission appoint a co-Chair of the SWG MSE PS representing the TCC.

46. The SWG MSE PS agreed that future meetings should include scientists, managers and stakeholders to facilitate communication and completion of this important work.

Agenda Item 9. Adoption of report

47. The SWG MSE PS03 Report was adopted by consensus.

Agenda Item 10. Close of the Meeting

48. The meeting closed at 13:10 on 1 March 2023, Tokyo time.

Annexes:

Annex A – Agenda

Annex B – List of documents

Annex C – List of participants

Annex D – Timeframe of NPFC meetings toward setting a Harvest Control Rule

Annex E – Timeline and tasks

Agenda

Agenda Item 1. Introductory items

- 1.1 Opening of the meeting
- 1.2 Adoption of agenda
- 1.3 Meeting logistics

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

- 2.1 SWG MSE PS02
- 2.2 SSC PS10

Agenda Item 3. Review progress on development of an interim harvest control rule (HCR) as a short-term task

- 3.1 Management objectives
- 3.2 Reference points and tuning criteria
- 3.3 Conditioning of operating models (OMs)
- 3.4 Candidate HCRs and constraints therein
- 3.5 Performance measures
- 3.6 Simulation platform
- 3.7 Template for presentation of results
- 3.8 Other matters

Agenda Item 4. Discussion toward development of management procedures (MPs) as a mid-term goal

- 4.1 Management objectives and some constraint conditions for the regulation of fishery
- 4.2 Technical matters on operating models, MPs, performance measures and simulation

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

- 5.1 Implementation schedule of an HCR
- 5.2 Mid-term plan of implementation and its review process
- 5.3 Definition of exceptional circumstances

Agenda Item 6. Other matters

- 6.1 Selection of co-Chair

Agenda Item 7. Timeline and future process

- 7.1 Timeline

7.2 Future process with assistance of SSC PS

7.3 Workplan till SWG MSE PS04 meeting

Agenda Item 8. Recommendations to the Commission

Agenda Item 9. Adoption of report

Agenda Item 10. Close of the meeting

List of Documents**MEETING INFORMATION PAPERS**

Document Number	Title
NPFC-2023-SWG MSE PS03-MIP01	Meetings Information
NPFC-2023-SWG MSE PS03-MIP02	Provisional Agenda
NPFC-2023-SWG MSE PS03-MIP03	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Document Number	Title
NPFC-2022-SWG MSE PS02-Final Report	SWG MSE PS02 Meeting Report
NPFC-2022-SSC PS10-Final Report	SSC PS10 Meeting Report

WORKING PAPERS

Document Number	Title
NPFC-2023-SWG MSE PS03-WP01 (Rev. 1)	Development of HCR for Pacific saury for the short-term objective

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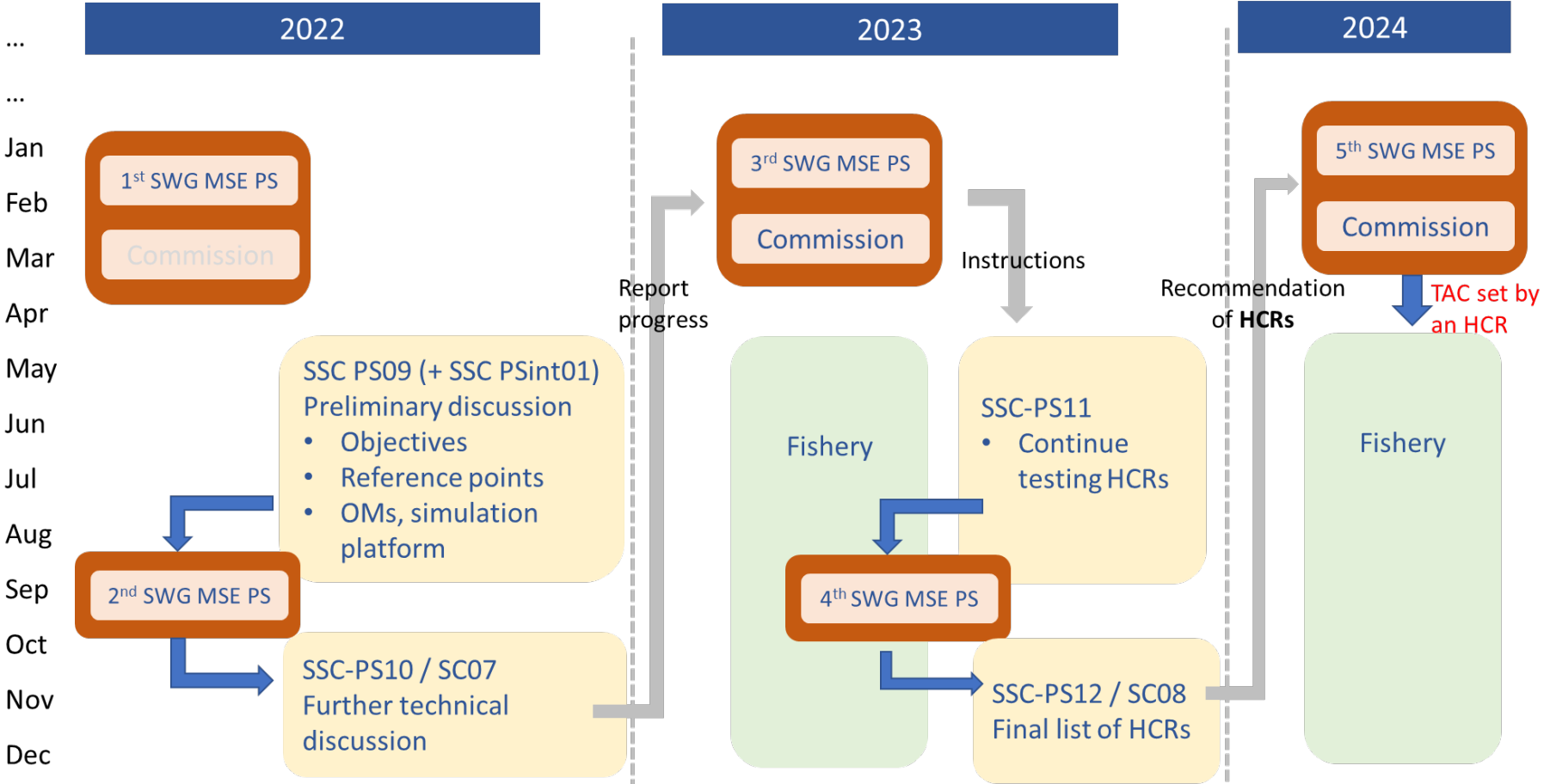
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Timeframe of NPFC meetings toward setting a Harvest Control Rule

Implementation schedule



Timeline and tasks

Meeting	Date	Task	Format
COM07	Mar 22-24, 2023	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS 01-03 reports 	In-person (hybrid)
Intersessional technical work (under SSC PS)	April-May	<ul style="list-style-type: none"> Start discussion on CPUE Review other issues if ready 	Virtual
Ditto	June	<ul style="list-style-type: none"> Review progress on OMs including development of robustness scenarios Review progress on evaluation of HCRs 	Virtual
Ditto	Late July	<ul style="list-style-type: none"> Review further progress on OMs Review further progress on evaluation of HCRs 	Virtual
SSC PS11	Aug 28-31	<ul style="list-style-type: none"> Review standardized CPUE up to 2022 Review Japanese survey estimates including 2023 Review progress on new assessment models and finalize a set of models and specification Review progress on HCR works Conduct initial BSSPM analyses to see if there are any gaps between 2022 and 2023 assessments 	In-person (hybrid)
SWG MSE PS 04	Aug 31-Sep 2	<ul style="list-style-type: none"> Review progress on HCR works Finalize a set of OMs, management objectives and template of performance metrics and candidate HCRs Capacity building 	In-person (hybrid)
Intersessional technical work (under SSC PS)	Oct-Nov	<ul style="list-style-type: none"> Review progress on tasks identified in SWG MSE PS 04 	Virtual
SSC PS12	Dec 11-14	<ul style="list-style-type: none"> Update BSSPM analyses and provide recommendations to SC/COM Review progress on new assessment models and finalize a set of models and specification (relevant to the mid-term MSE work as conditioning of operating models) Finalize technical works 	In-person (hybrid)
SWG MSE PS 05	1 month prior to COM08	<ul style="list-style-type: none"> Select an HCR and make a recommendation to the Commission 	In-person (hybrid)
COM08	2024	<ul style="list-style-type: none"> Adoption of CMM on HCR for PS? 	In-person (hybrid)

CMM 2023-08
(Entered into force dd mm 2023)

CONSERVATION AND MANAGEMENT MEASURE FOR PACIFIC SAURY

The North Pacific Fisheries Commission (NPFC),

Reaffirming the General Principles, Article 3 of the Convention, in particular, paragraph (b) stipulating that measures are adopted, based on the best scientific information available, to ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield, and paragraph (f) stipulating that preventing or eliminating overfishing and excess fishing capacity and ensuring that levels of fishing effort or harvest levels are based on the best scientific information available and do not exceed those commensurate with the sustainable use of the fisheries resources;

Gravely concerned that, according to the latest stock assessment provided by the 7th meeting of the Scientific Committee (SC7) in December 2022, stock biomass of Pacific saury remains at historically low levels in recent years,

Recognizing that SC7 recommended that the Commission consider the advice, in particular “a reduction to the TAC for 2021-22 would increase the probability of higher biomass and catch levels in the Pacific saury stock” and “an HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury”;

Further recognizing the urgent needs to take responsible actions to prevent further degradation and to ensure recovery of the Pacific saury stock;

Adopts the following conservation and management measure in accordance with Article 7 of the Convention:

[EFFORT MANAGEMENT]

1. Members of the Commission, not described under Paragraph 2, and that are currently fishing for Pacific saury shall refrain from expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for Pacific saury from the historical existing level.
2. Members fishing for Pacific saury in areas of their jurisdiction that are adjacent to the Convention Area shall refrain from rapid expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for Pacific saury from the

historical existing level.¹

3. Members of the Commission participating in Pacific saury fisheries in areas under national jurisdiction adjacent to the Convention Area are, in accordance with relevant provisions of Article 3 of the Convention, requested to take compatible measures in paragraph 2.
4. Each Member of the Commission participating in Pacific saury fisheries shall implement either of the following measures;
 - a) to reduce the number of fishing vessels flying its flag and fishing for Pacific saury in the Convention Area by 10% from the number of its fishing vessels that fished for Pacific saury in the Convention Area in 2018; or
 - b) to prohibit fishing vessels flying its flag from engaging in fishing for Pacific saury in the Convention Area outside its designated fishing period of no longer than 180 consecutive days each year.

Each Member shall notify the Secretariat of the measure it implements and its designated fishing period in case of b. above no later than May 1st each year. The Secretariat shall summarize the notifications from Members and make it available to all Members and CNCPs. This Paragraph does not apply to Members whose fishing vessels that fished for Pacific saury in the Convention Area in 2018 was less than five (5).

[CATCH MANAGEMENT]

5. For 2023 and 2024, Members of the Commission agree, having regard to the advice of the Scientific Committee, that the annual catches of Pacific saury in the entire area (the Convention Area and the areas under their jurisdiction adjacent to the Convention Area) should not exceed 250,000 metric tons.
6. In 2023 and 2024, the annual total allowable catch (TAC) of Pacific saury in the Convention Area shall be limited to 150,000 metric tons.
7. As a provisional measure until the Commission decides allocation of the TAC, each Member of the Commission shall reduce the annual total catch of Pacific saury by the fishing vessels entitled to fly its flag in 2023 and 2024 by 55% from its reported catch in 2018 so that the total catch in the Convention Area will not exceed the TAC set out in paragraph 6.
8. To comply with the provisional measures above, Members of the Commission shall report to the Executive Secretary, in the electronic format, weekly catches of Pacific saury in the Convention

¹ Paragraph 2 applies to Russia and Japan

Annex U: CMM 2023-08 for Pacific Saury

Area by fishing vessels flying their flags by Wednesday of the next week. The Executive Secretary shall make publicly available the compiled catch of Pacific saury in the Convention Area on the Commission's website without delay.

9. Members of the Commission and CNCPs shall ensure that fishing vessels flying their flag that fish Pacific saury record their catches and report them to the relevant flag state authorities in accordance with their national data recording and reporting requirements.
10. In the event that a Member reaches 70% of its catch limit set out in paragraph 7, the Executive Secretary shall inform that Member of that fact, with a copy to all other Members. That Member shall close the fishery for its flagged vessels when the total catch of its flagged vessels is equivalent to 100% of its catch limit. Such Member shall notify promptly the Executive Secretary of the date of the closure, except as described in paragraph 11.
11. Members fishing for Pacific saury in areas of their jurisdiction² that are adjacent to the Convention Area may divert part of their catch limit for areas under their jurisdiction to their own catch of Pacific saury in the Convention Area by vessels entitled to fly their flags and authorized to fish for Pacific saury.

[OTHER MEASURES]

12. Development of new fishing activity for the Pacific saury fishery in the Convention Area by Members without documented historical catch for Pacific saury in the Convention Area shall be determined in accordance with relevant provisions, as appropriate, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.
13. Members of the Commission shall ensure that fishing vessels flying its flag operating in the Convention Area to fish Pacific saury be equipped with an operational vessel monitoring system that is activated at all times.
14. In order to prevent discards and contribute to the proper stock assessment, Members of the Commission shall take necessary measures to ensure that fishing vessels flying their flags in the Convention Area retain all the catch of Pacific saury on board.
15. In order to protect juvenile fish, Members of the Commission shall take measures for fishing vessels flying their flags to refrain from fishing for Pacific saury in the areas east of 170°E from June to July. The SC and its subsidiary Small Scientific Committee on Pacific Saury will submit to the Commission relevant scientific information on geographical distribution of

² Paragraph 9 applies to Russia and Japan

Annex U: CMM 2023-08 for Pacific Saury

juvenile fish in the Convention Area, and its migration patterns.

16. Based on advice and recommendations from the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS), the Commission shall establish harvest control rules for Pacific saury as an interim measure as soon as possible, preferably at the 8th Commission annual meeting. The SWG MSE PS shall also consider establishment of a management procedure to be formulated through an MSE process. The Commission shall continue to fund an external expert to support the process.
17. This CMM shall in no case be a basis for any future CMM for Pacific saury.
18. Consideration should be given to development aspirations of small island developing States in accordance with international law in revising this CMM.
19. The Commission shall review and revise, as appropriate, this CMM based on the advice and recommendations from the SC and the SWG MSE PS, but no later than at the 9th Commission meeting.
20. This CMM shall enter into force on May 1st, 2023, replacing CMM 2021-08 and will be reviewed on a regular basis.

**Annex V: CMM 2023-11 for Japanese Sardine, Neon Flying Squid
and Japanese Flying Squid**

CMM 2023-11

(Entered into force dd mm 2023)

**CONSERVATION AND MANAGEMENT MEASURE FOR JAPANESE SARDINE,
NEON FLYING SQUID AND JAPANESE FLYING SQUID**

The North Pacific Fisheries Commission,

Recalling that six pelagic species—Pacific saury, chub mackerel, spotted mackerel, Japanese sardine, neon flying squid, and Japanese flying squid—are identified as priority species;

Also recalling that the NPFC has adopted the CMMs on two species—Pacific saury and chub mackerel;

Noting that specific measures for the remaining four species have yet to be introduced while those species have been subject to extensive fishing practices, whether they are target or bycatch species;

Reaffirming the General Principles provided in Article 3 of the Convention, in particular, Paragraph (h) stipulating that any expansion of fishing effort does not proceed without prior assessment of the impacts of those fishing activities on the long-term sustainability of fisheries resources;

Adopts the following conservation and management measure in accordance with Article 7 of the Convention:

1. Members of the Commission and Cooperating non-Contracting Parties (CNCs) with substantial harvest of any of Japanese sardine, neon flying squid and Japanese flying squid (hereinafter referred to as “the three Pelagic Species”) in the Convention Area shall refrain from expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for such species from the historical existing level until the stock assessment for such species by the SC has been completed.
2. Members of the Commission and CNCs without substantial harvest of the three Pelagic Species in the Convention Area are encouraged to refrain from expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for such species from the historical existing level until the stock assessment for such species by the SC has been completed.
3. Members of the Commission participating in fishing for the three Pelagic Species in areas under their jurisdiction adjacent to the Convention Area are requested to take compatible measures in

**Annex V: CMM 2023-11 for Japanese Sardine, Neon Flying Squid
and Japanese Flying Squid**

paragraph 1. Such Members¹ may divert part of their catch limit for areas under their jurisdiction to their own catch of the species in the Convention Area by vessels entitled to fly their flags and authorized to fish for the species, provided that: (i) the Member has established a catch limit for the species in its jurisdiction; (ii) the Member has notified the Commission of the catch limit; and (iii) the total catch of the species in the Convention Area and the areas under their jurisdiction adjacent to the Convention Area will not exceed the Member's total catch limit for its jurisdiction respectively.

4. Development of new fishing activity for the three Pelagic Species in the Convention Area by Members of the Commission without documented historical catch for such species in the Convention Area shall be determined in accordance with relevant provisions, as appropriate, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.
5. Members of the Commission and CNCPs shall ensure that fishing vessels flying their flag operating in the Convention Area authorized to fish the three Pelagic Species are to be equipped with an operational vessel monitoring system that is activated at all times.
6. Members of the Commission and CNCPs shall ensure that fishing vessels flying their flag that fish the three Pelagic Species record their catches and report them to the relevant flag state authorities in accordance with their national data recording and reporting requirements.
7. Members of the Commission and CNCPs shall provide their data on the three Pelagic Species in accordance with the data requirements adopted by the Commission in the Annual Report by the end of February, every year. The Commission shall review such information at the annual meeting of every year.
8. Members of the Commission and CNCPs shall cooperate to take necessary measures including sharing information, in order to accurately understand the situation and eliminate IUU fishing for the three Pelagic Species.
9. After a stock assessment for any of the three Pelagic Species has been completed, the provisions in Paragraph 1 shall be reviewed by the Commission and those provisions shall not be a precedent to hinder those Members who are not harvesting substantial amounts of the three Pelagic Species assessed in the Convention Area to develop their own fisheries in the Convention Area noting the Commission shall regularly review the harvests of such species in the Convention Area by all Members.
10. This management measure shall expire and be replaced by the measure to be adopted by the Commission based on the advice and recommendations from the Scientific Committee.

¹ Paragraph 3 applies to Russia and Japan

CMM 2023-07
(Entered into forced mm 2023)

CONSERVATION AND MANAGEMENT MEASURE FOR CHUB MACKEREL

The North Pacific Fisheries Commission (NPFC),

Recognizing that outcomes of the small ad hoc workshop for the scientific analysis of chub mackerel stock were presented to the Scientific Committee (SC) in April 2017 and the SC recommended to establish the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA);

Noting that CMM 2016-07 states the SC will complete the stock assessment of chub mackerel as soon as practicable, even if such assessment is provisional, and provide advice and recommendations to the Commission in accordance with Article 10, paragraph 4(b) of the Convention;

Reaffirming the General Principles provided in Article 3 of the Convention, in particular, paragraph (h) stipulating that any expansion of fishing effort does not proceed without prior assessment of the impacts of those fishing activities on the long-term sustainability of fisheries resources;

Noting paragraph 1(a) of Article 7 of the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks of 4 December 1995 (hereinafter, “1995 Agreement”), stipulating that the relevant coastal States and the States whose nationals fish for straddling fish stocks in the adjacent high seas area shall seek to agree upon the measures necessary for the conservation of these stocks in the adjacent high seas area;

Recognizing paragraph 2(a) of Article 7 of the 1995 Agreement stipulating that the conservation and management measures adopted and applied in accordance with article 61 of the United Nations Convention on the Law of the Sea in respect of the same stocks by coastal States within areas under national jurisdiction and ensure that measures established in respect of such stocks for the high seas do not undermine the effectiveness of such measures;

Reaffirming paragraph (i) of Article 3 of the Convention, stipulating in accordance with Article 7 of the 1995 Agreement, that conservation and management measures established for straddling fish stocks on the high seas and those adopted for areas under national jurisdiction are compatible in order to ensure conservation and management of these fisheries resources in their entirety;

Recalling that concern was expressed on an adverse impact on the stock of chub mackerel given the rapid increase in vessels that appear to be fishing for chub mackerel in the Convention Area, as articulated in paragraphs 9 and 10 of Report of the 1st Meeting of the Technical and Compliance Committee;

Adopts the following conservation and management measure in accordance with Article 7 of the Convention:

1. Members of the Commission and Cooperating non-Contracting Parties (CNCs) with substantial harvest of chub mackerel in the Convention Area shall refrain from expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for chub mackerel from the historical existing level until the stock assessment by the SC has been completed.
2. Members of the Commission and CNCs without substantial harvest of chub mackerel in the Convention Area are encouraged to refrain from expansion, in the Convention Area, of the number of fishing vessels entitled to fly their flags and authorized to fish for chub mackerel from the historical existing level until the stock assessment by the SC has been completed.
3. Members of the Commission participating in chub mackerel fisheries in areas under national jurisdiction adjacent to the Convention Area are requested to take compatible measures in paragraph 1. Such Members¹ may divert part of their catch limit for areas under their jurisdiction to their own catch of chub mackerel in the Convention Area by vessels entitled to fly their flags and authorized to fish for chub mackerel, provided that: (i) the Member has established a catch limit for chub mackerel in its jurisdiction; (ii) the Member has notified the Commission of the catch limit; and (iii) the total catch of the Member in the Convention Area and the areas under their jurisdiction adjacent to the Convention Area will not exceed the Member's total catch limit for its jurisdiction.
4. Members of the Commission and CNCs shall ensure that fishing vessels flying their flag that fish for Chub mackerel record their catches and report them to the relevant flag State authorities in accordance with their national data recording and reporting requirements.
5. Development of new fishing activity for the chub mackerel fishery in the Convention Area by Members of the Commission without documented historical catch for chub mackerel in the Convention Area shall be determined in accordance with relevant provisions, including but not limited to, as appropriate, Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.

¹ Paragraph 3 applies to Russia and Japan.

6. Members of the Commission and CNCPs shall ensure that fishing vessels flying their flag operating in the Convention Area to fish chub mackerel are to be equipped with an operational vessel monitoring system that is activated at all times.
7. Members of the Commission and CNCPs shall provide their data on chub mackerel separated by the Convention Area and the areas under national jurisdiction adjacent to the Convention Area in accordance with the data requirements adopted by the Commission in the Annual Report by the end of February, every year. The Commission shall review such information at the annual meeting of every year.
8. Members of the Commission and CNCPs shall cooperate to take necessary measures including sharing information, in order to accurately understand the situation and eliminate IUU fishing for chub mackerel.
9. The SC and its subsidiary Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) will complete the stock assessment of chub mackerel as soon as possible in accordance with the terms of reference agreed at the TWG CMSA meeting in December 2017, even if such assessment is provisional, and provide advice and recommendations to the Commission in accordance with Article 10, paragraph 4(b) of the Convention.
10. After chub mackerel stock assessment has been completed, the provisions in Paragraph 1 shall be reviewed by the Commission and those provisions shall not be a precedent to hinder those Members who are not harvesting substantial amounts of chub mackerel in the Convention Area to develop their own chub mackerel fisheries in the Convention Area noting the Commission shall regularly review chub mackerel harvests in the Convention Area by all Members.
11. This management measure shall expire and be replaced by the measure to be adopted by the Commission based on the advice and recommendations from the Scientific Committee.
12. This CMM is an amendment of the NPFC CMM 2019-07.

NPFC High Seas Boarding and Inspection Covid-19 Recommendation

Acknowledging the current state of the COVID-19 pandemic, the Commission recommends the wearing of a protective mask by inspectors during high seas boarding operations while in an enclosed space or when unable to maintain physical separation of 2 meters.

This recommendation, which is non-binding, will remain in place until the next meeting of the Commission, and supersedes all previous recommendations pertaining to COVID-19 precautions (including Annex F of COM06 Report: NPFC High Seas Boarding and Inspection in a COVID-19 Environment - Best Practices).

CMM 2023-14

(Entered into force dd mm 2023)

CONSERVATION AND MANAGEMENT MEASURE ON SHARKS

The North Pacific Fisheries Commission (NPFC),

Recognizing the biological importance of sharks in the marine ecosystems as a key predatory species of the North Pacific Ocean, and the need to promote their long-term conservation;

Concerned with vulnerability of certain shark species to exploitation given their low biological productivity and complex spatial structures, and especially mindful that vulnerable species of sharks are more susceptible to overfishing even at low levels of fishing mortality;

Greatly troubled by the observed incidental catch of sharks by fishing vessels, and practice of shark finning on board fishing vessels engaging in fishing activities in the Convention Area;

Mindful of the lack of knowledge on sharks in the North Pacific Ocean because of the lack of available data on catch, effort, landings, and trade, and the consequent need to adopt a precautionary approach to fisheries management;

Recalling Article 7(1)(c) of the Convention which states that the Commission shall adopt, where necessary, conservation and management measures for species belonging to the same ecosystem or dependent upon or associated with the target stocks;

Recalling further Article 21(2) of the Convention which states that the Commission shall take into account the conservation and management measures or recommendations adopted by other regional fisheries management organizations that have competence in relation to areas adjacent to the Convention Area or in respect of fisheries resources not covered by this Convention, species belonging to the same ecosystem or dependent upon or associated with the target stocks, and that have objectives that are consistent with and supportive of the objective of this Convention;

Adopts the following:

Definitions

1. This measure shall be interpreted in accordance with the Convention.
2. For the purpose of this measure, the following definitions apply:
 - a) “shark” includes any species of shark, skate, ray, or chimaera (class Chondrichthyes), either in whole or in part; and
 - b) “shark finning” refers to the practice of removing a shark’s fin from the corresponding shark and discarding the remainder of the shark prior to the point of first landing.

Scope

3. This measure applies to all fishing vessels included in the NPFC Vessel Registry in the Convention Area not otherwise registered and operating within the area of competence of another regional fisheries management organization.

Shark Conservation and Management

4. Recognizing there are no directed shark fisheries currently managed by the Commission, Commission Members and Cooperating non-Contracting Parties shall ensure that any directed shark fishing follow the process outlined in Article 3(h) of the Convention.
5. For greater clarity, paragraph 4 does not apply to fishing vessels authorized to engage in shark fisheries managed by another regional fisheries management organization.

Prohibition on Shark Finning

6. No fishing vessel shall engage in shark finning.
7. No fishing vessel shall:
 - a) retain on board, or otherwise possess or control, a shark fin that is not naturally attached to the corresponding shark; or
 - b) transship, or land, a shark fin that is not naturally attached to the corresponding sharkunless the fishing vessel complies with paragraph 8.
8. A fishing vessel may only remove a shark fin from the corresponding shark if the shark is incidentally caught, taken, or harvested, and if:
 - a) the shark fin and the corresponding shark can be readily identified; and

b) one of the following methods is used:

- i) the shark fin is stored in the same bag, preferably a biodegradable one, as the corresponding shark;
- ii) the shark fin is bound to the corresponding shark using rope or wire; or
- iii) the shark fin and the corresponding shark are identically, uniquely, and numerically tagged in a manner that an authorized inspector can readily identify the matching of the shark fin to the corresponding shark.

On-Board Record of Interactions with Sharks

- 9. A fishing vessel shall record, and maintain a record of, any shark catch in the Convention Area, to the extent possible by species, in its logbook on board the fishing vessel.
- 10. A Commission Member, or Cooperating non-Contracting Party, shall annually report all shark catches, to the extent possible by species, from their fishing vessels to the Secretariat.
- 11. The requirements contained in paragraph 9 will come into effect 1 January 2024.

**Annex Z: CMM 2023-15 on the Prevention, Reduction, and
Elimination of Marine Pollution**

CMM 2023-15
(Entered into force dd mm 2023)

**CONSERVATION AND MANAGEMENT MEASURE ON THE PREVENTION,
REDUCTION, AND ELIMINATION OF MARINE POLLUTION**

The North Pacific Fisheries Commission (NPFC),

Concerned with the prevalence of marine pollution in the world's oceans, and its detrimental effects on marine species, marine ecosystems, and the livelihoods of legitimate fishers;

Recognizing the significant ecological threat posed by abandoned, lost, or discarded fishing gear (ALDFG) to the sustainability of fisheries resources;

Aware of both the role fishing vessels have in producing marine pollution during fishing activities from waste, harmful liquid substances, and ALDFG fishing gear, and their equal potential to combat marine pollution;

Committed to the use of the precautionary approach in fisheries management in light of the lack of data and information on marine pollution in the North Pacific Ocean;

Recalling that Article 3(k) of the Convention requires Commission Members and Cooperating non-Contracting Parties to minimize pollution or waste originating from fishing vessels, catch by lost or abandoned gear, and impacts on other species and marine ecosystems through measures including, to the extent practicable, the development and use of selective, environmentally safe, and cost-effective fishing gear and techniques;

Noting that the International Convention for the Prevention of Pollution from Ships (MARPOL) seeks to eliminate and reduce the amount of garbage being discharged into the sea from ships and that Annex V of MARPOL applies to all vessels but that there is limited monitoring and implementation of MARPOL obligations on fishing vessels, and consequently little information exists about illegal pollution activities by fishing vessels at sea;

Noting further that the need to prevent and significantly reduce marine pollution of all kinds was affirmed at the United Nations Conference to Support the Implementation of Sustainable Development Goal 14 through the adoption of paragraph 13(g) of the "Our ocean, our future: call for action" declaration;

**Annex Z: CMM 2023-15 on the Prevention, Reduction, and
Elimination of Marine Pollution**

Desiring to establish rules, and encourage advancements, in the prevention, reduction, and elimination of marine pollution in the North Pacific Ocean;

Adopts the following:

Definitions

1. This measure shall be interpreted, unless otherwise stated, in accordance with the Convention.
2. The following definitions apply:
 - a) “fishing gear” means any physical device or part thereof or combination of items that may be placed on or in the water or on the seabed with the intended purpose of catching, taking, or harvesting, or controlling for the subsequent catching, taking, or harvesting, of fisheries resources;
 - b) “garbage” means all kinds of food wastes, domestic wastes, and operational wastes as defined under Annex V of MARPOL, including incinerator ashes, cooking oil, floating dunnage, or lining and packing materials¹, but excluding plastics; and
 - c) “plastics” means a solid material which contains as an essential ingredient one or more high molecular mass polymers and which is formed during either manufacture of the polymer or the fabrication into a finished product by heat or pressure.

Scope

3. This measure applies to all fishing vessels in the Convention Area.

Prohibitions on Marine Pollution

Prohibition on Discard or Abandonment of Fishing Gear

4. No fishing vessel shall discard or abandon fishing gear at sea.
5. A fishing vessel is deemed to have discarded fishing gear if it relinquishes control of the fishing gear, except in the event of distress.

¹ For greater clarity, a reference to garbage in paragraphs 11 – 15 does not include garbage that is permitted to be released under Annex V of MARPOL

**Annex Z: CMM 2023-15 on the Prevention, Reduction, and
Elimination of Marine Pollution**

6. A fishing vessel is deemed to have abandoned fishing gear if it loses control of the fishing gear, or relinquishes control due to *force majeure*, and does not make every reasonable effort to retrieve the fishing gear.

Lost Fishing Gear

7. If a fishing vessel loses control of its fishing gear, or relinquishes control due to *force majeure*, and makes every reasonable effort to retrieve the fishing gear, but it is impossible to retrieve, the fishing gear is considered lost.

Prohibition on Release of Plastics

8. No fishing vessel shall release any plastics, including synthetic ropes, synthetic fishing nets, plastic garbage bags, or incinerator ashes from plastics products, at sea.

Prohibition on the Release of Other Marine Pollutants

9. A Commission Member, or Cooperating non-Contracting Party, is encouraged to implement appropriate on-board storage for, and to prohibit the release of the following discharges at sea by its fishing vessels, except as permitted under applicable international instruments:
 - a) oil, fuel products, or oily residues;
 - b) sewage; and
 - c) garbage.

Other Requirements

Preventive Measures

10. A fishing vessel shall take all reasonable precautions to prevent:
 - a) the abandonment, loss, or discard of fishing gear at sea; and
 - b) the release of garbage, and plastics, at sea.

Retrieval of Fishing Gear and Other Marine Pollutants

11. A fishing vessel shall make every reasonable effort to retrieve any abandoned, lost, or discarded gear, garbage, or plastics that it has released as soon as possible.

**Annex Z: CMM 2023-15 on the Prevention, Reduction, and
Elimination of Marine Pollution**

12. A fishing vessel is encouraged to retrieve any abandoned, lost, or discarded fishing gear, garbage, or plastics that it observes at sea.
13. A fishing vessel is encouraged to carry equipment on board to retrieve any abandoned, lost, or discarded fishing gear, garbage, or plastics that it released or observes.

Storage, Retention, and Disposal of Marine Pollutants

14. A fishing vessel shall, to the extent possible, safely store and retain on board all fishing gear, garbage, and plastics until they can be disposed of at an adequate port reception facility.

Review

15. The Commission shall review this measure annually, taking into account, *inter alia*:
 - a) the effectiveness of this measure in preventing, reducing, and eliminating marine pollution, including the potential for reporting requirements; and
 - b) the development of international standards, guidelines, or best practices, or international instruments related to the prevention, reduction, and elimination of marine pollution.

CMM 2023-03

(Entered into force dd mm 2023)

CONSERVATION AND MANAGEMENT MEASURE ON TRANSSHIPMENTS

The North Pacific Fisheries Commission (NPFC),

Deeply concerned about the negative impacts of illegal, unreported, and unregulated (IUU) fishing and its detrimental effect upon fish stocks, marine ecosystems, and the livelihoods of legitimate fishers, and the increasing need for food security on a global basis;

Aware of the need to conduct transshipments of fisheries resources and products of fisheries resources taken in the Convention Area;

Recognizing that while transshipment is an important global commercial fishing practice, if not adequately managed, it may increase IUU fishing of NPFC fisheries resources in the North Pacific Ocean;

Acknowledging that effective conservation and management of NPFC fisheries resources is dependent on accurate, timely, and shared reporting of catches;

Recognizing that effective monitoring, control, and surveillance activities in the high seas require access to information about transshipments and other transfer activities before they occur;

Noting Article 7(2)(a) of the Convention which states that the Commission shall establish procedures for the regulation and monitoring of transshipment of fisheries resources and products of fisheries resources taken in the Convention Area, including notification to the Commission of the location and quantity of any transshipment; and

Desiring to establish the necessary rules and procedures to monitor, report, and verify transshipments to support monitoring, control, and surveillance activities, enhance science and compliance efforts, and fulfill the objective of the Convention;

Adopts the following:

Definitions

1. This measure shall be interpreted, unless a contrary intention appears, in accordance with the Convention.¹
2. The following definitions apply:
 - a) “landing” means all transfers of any quantity of fish onboard from a vessel, other than a transshipment, including transfers of fish to a port facility, transfers of fish from one vessel to another through a port facility, or other means of transportation, and transfers of fish from a vessel to a container, truck, train, or another means of transportation;
 - b) “other transfer activity” means a transfer of fuel, gear, materials, or other supplies, or a transfer of at least one person, from one fishing vessel to another fishing vessel in the Convention Area;
 - c) “port” means any harbour, marine terminal, shore-side facility, or other shore-side place used for landing, loading and unloading, transshipping, packaging, or processing of fisheries resources and products thereof or the refuelling or resupplying of fishing vessels in waters of national jurisdiction;
 - d) “product of fisheries resources” means any article that is produced from or composed of, in whole or in part, any fisheries resource; and
 - e) “trip” means a voyage commencing at the time a fishing vessel leaves a port to engage in a fishing activity and terminates at the time the fishing vessel enters a port.

Scope

3. This measure applies to:
 - a) any transshipment, either at sea or in port, of any NPFC fisheries resources, or product thereof, taken in the Convention Area, except those that have been previously landed;
 - b) any transshipment that occurs in the Convention Area involving a fishing vessel included in the NPFC Vessel Registry; or,
 - c) any other transfer activity in the Convention Area involving a fishing vessel intending to engage in, or having engaged in, a fishing activity in the Convention Area.

¹ For this measure, an auxiliary tender boat is regarded as part of its parent receiving vessel under the following circumstances: it is used to transport unprocessed fish from the offloading vessel to the parent receiving vessel; it is loaded onboard the parent receiving vessel on navigation; it operates in the line of sight of the parent receiving vessel; and it is dependent on the parent receiving vessel for transportation to the Convention Area.

Fishing Vessels Authorized to Engage in Transshipments

Rules for Engaging in Transshipments

4. A fishing vessel shall only engage in a transshipment, or other transfer activity in the Convention Area, if both the offloading and receiving vessel are duly authorized by its Flag State and included in the NPFC Vessel Registry.
5. A fishing vessel is prohibited from operating as both an offloading vessel and a receiving vessel in the same trip.

Authorization from Relevant Coastal or Port State

6. If a fishing vessel intends to engage in a transshipment in an area under national jurisdiction, including a port, the fishing vessel shall receive an authorization from the relevant coastal or port State before engaging in the transshipment.

General Reporting Requirements

Reporting

7. All reporting to the Secretariat related to a transshipment, or other transfer activity, shall be provided electronically (e.g. email, facsimile, etc.). This includes advance notifications, transshipment declarations, and observer transshipment reports.
8. All reporting shall comply with the procedures to be adopted by the Commission.

Reporting of Bycatch and Unregulated Species

9. All reporting related to a transshipment shall include all marine species, including bycatch and unregulated species, taken in the Convention Area.

Record of Transshipment Declarations

10. A fishing vessel shall maintain an electronic or physical record on board the fishing vessel of each transshipment it has engaged in during the current trip. The record shall include each transshipment declaration.

11. A Commission Member, or Cooperating non-Contracting Party, shall maintain an electronic or physical record of each transshipment engaged in by each of its fishing vessels for the current year. The record shall include each transshipment declaration.

Advance Notifications

Advance Notifications for Transshipments

12. A fishing vessel, or a Commission Member or Cooperating non-Contracting Party on behalf of the vessel, shall provide an advance notification to the authorities listed in paragraph 13 as soon as possible, and at least 24 hours in advance of the intended transshipment. The advance notification form is included in Annex I.
13. The fishing vessel, or Commission Member or Cooperating non-Contracting Party, shall provide the advance notification to:
 - a) the Commission Member, or Cooperating non-Contracting Party, of its flag, if the advance notification is provided by the fishing vessel; and
 - b) the Secretariat.

Advance Notification of Other Transfer Activities

14. A receiving vessel, or a Commission Member or Cooperating non-Contracting Party on behalf of the receiving vessel, shall provide an advance notification to the authorities listed in paragraph 13 as soon as possible, and at least 24 hours in advance of the intended other transfer activity. The advance notification form is included in Annex I.

Modifications to the Advance Notification

15. If the transshipment does not start after 24 hours of the estimated start time, or within 20 nautical miles of the estimated start location, as contained in the advance notification, the fishing vessels involved in the transshipment, or Commission Members or Cooperating non-Contracting Parties on their behalf shall modify the submitted advance notification.
16. If the other transfer activity does not start after 24 hours of the estimated start time, or within 20 nautical miles of the estimated start location, as contained in the advance notification, the receiving vessel, or Commission Member or Cooperating non-Contracting Party of the receiving vessel, shall modify the submitted advance notification.

Provision of Authorization from Relevant Flag and Coastal or Port State

17. If a fishing vessel intends to engage in a transshipment in an area under national jurisdiction, including in a port, it shall not start the operation unless an authorization from the relevant flag and coastal or port State has been provided following the receipt of the transshipment advance notification.

Cancellation of Transshipment

18. If a transshipment is cancelled before it is undertaken, a fishing vessel intending to engage in the transshipment, or the Commission Member or Cooperating non-Contracting Party whose fishing vessel intended engage in the transshipment, shall notify the Secretariat of the cancellation as soon as possible.

Other At-Sea Requirements

Commission Member and Cooperating non-Contracting Party Responsibility

19. After receiving an advance notification for a transshipment, a Commission Member, or Cooperating non-Contracting Party, shall verify that their fishing vessel complies with the Convention and all conservation and management measures.

20. If a Commission Member, or Cooperating non-Contracting Party, receives suitably documented information that its flagged fishing vessel is, or appears to be, non-compliant with the Convention, or a conservation and management measure, the Commission Member, or Cooperating non-Contracting Party, shall conduct an investigation.

21. The investigating Commission Member, or Cooperating non-Contracting Party, shall provide a report on the progress of the investigation, including an attestation of the fishing vessel's status under paragraph 19, no later than 60 days after receiving the information, to:

- a) the Secretariat; and
- b) the Commission Member, or Cooperating non-Contracting Party that provided the information.

Following the investigation process, information shall be provided about any appropriate enforcement action taken in line with its national laws.

22. If a fishing vessel receives catch from more than one offloading vessel, the fishing vessel shall ensure that the catch from each offloading vessel is stored separately and readily identifiable. The receiving vessel shall have a stowage plan available on board at all times.

Mobile Transmitting Unit Failure

23. In the event of mobile transmitting unit failure, the transshipment shall be suspended, and only resume once the fishing vessel complies with the relevant procedures in *CMM on the Vessel Monitoring Systems (VMS)*.

Transshipment Declaration

24. A fishing vessel having engaged in, or a Commission Member or Cooperating non-Contracting Party whose fishing vessel has engaged in, a transshipment shall provide a transshipment declaration to the authorities listed in paragraph 25 as soon as possible, and no later than 10 days after the transshipment. The transshipment declaration form is included in Annex II.
25. A fishing vessel, or a Commission Member or a Cooperating non-Contracting Party, shall provide the transshipment declaration to:
- a) the Commission Member, or Cooperating non-Contracting Party, of its flag; and
 - b) the Secretariat.

Independent Monitoring and Reporting

Responsibility for Observers

26. The Commission shall establish a regional observer and/or electronic monitoring program no later than its 9th Commission meeting. Until the Commission establishes an observer and/or electronic monitoring program, a Commission Member, or Cooperating non-Contracting Party, is responsible for the deployment of independent, impartial, and qualified observers to fulfill the requirements of this measure.
27. An observer is deemed to be independent, impartial, and qualified if the observer:
- a) is deployed from a Commission Member's, or Cooperating non-Contracting Party's, national observer program, and familiar with NPFC fisheries resources, fishing activities, and CMMs;

- b) is neither part of the crew, nor has any employment or family relationship to the ownership or operator of the fishing vessel; and
- c) does not have any shared business interests with the owner or operator of the fishing vessel.

28. An observer shall be provisioned, accommodated, including access to independent communications, and provided safe working conditions by the receiving vessel in accordance with the Commission Member's, or Cooperating non-Contracting Party's, domestic laws and regulations.

Deployment of Observers

29. A Commission Member, or Cooperating non-Contracting Party, shall ensure that its receiving vessels engaging in a transshipment have an observer on board.

30. A fishing vessel may only engage in one transshipment at a time for each observer that is available to monitor and report on the transshipment.

Access to Fishing Vessels

31. An observer shall have:

- a) full, unobstructed, and safe access to each fishing vessel involved in the transshipment, including, *inter alia*, access to crew, gear, equipment, records, electronic means of communication, and fish holds; and
- b) adequate and appropriate space to undertake their responsibilities pursuant to this measure.

Monitoring and Reporting by Observers

32. An observer shall monitor and report on, to the greatest extent possible, that the transshipment is conducted in a manner consistent with the advance notification and other information available to the observer, and in particular, verify the consistency of transshipped quantities of fisheries resources, or products of fisheries resources.

33. An observer shall record an observer report immediately after each transshipment and keep the report onboard, and provide an observer transshipment report, as specified in Annex III, as soon as possible, but no later than 10 days from the disembarkation of the observer, to:

- a) the Commission Member, or Cooperating non-Contracting Party, of the flags of the receiving vessel and the offloading vessel; and

b) the Secretariat.

34. In the case where an observer observes an activity or condition that is not consistent with this conservation and management measure, the observer shall notify the finding, as well as documented evidence, to the extent possible, without delay to the Secretariat and the authorities of the Commission Member or Cooperating non-Contracting Party of the flags of the receiving and offloading vessels.
35. The Commission Member or Cooperating non-Contracting Party of the flag of the vessel whose violation has been observed and notified shall make the best effort to respond to this notification through the Secretariat without delay and undertake investigation on the observed violation. The Commission Member or Cooperating non-Contracting Party shall report any finding and/or relevant actions taken in their Annual Report.
36. The obligations related to observer coverage included in this measure will come into effect as of September 1, 2023.

Data and Information Sharing

Establishment of a Transshipment Record

37. The Commission hereby establishes a record of transshipments, and other transfer activities, hereinafter named the NPFC Transshipment Record, to make all data and information, including all reporting related to, transshipments, and other transfer activities, available to Commission Members and Cooperating non-Contracting Parties, in accordance with the NPFC Data Sharing and Data Security Protocol.
38. The data and information on the NPFC Transshipment Record may be used for either scientific or compliance purposes by:
 - a) a Commission Member, or Cooperating non-Contracting Party; or
 - b) the Commission.
39. The Secretariat shall maintain the NPFC Transshipment Record in accordance with Annex IV.

Public Availability of Data and Information

40. The Secretariat shall make aggregated anonymized data and information related to transshipments publicly available on the NPFC website, in accordance with the NPFC Data Sharing and Data Security Protocol.

Sharing Data and Information with Authorized In-Port Inspectors and Port Authorities

41. An authorized in-port inspector, or port State authority, may request from the Secretariat, and the Secretariat may provide, data or information related to a fishing vessel's transshipments for in-port inspection purposes, in accordance with the NPFC Data Sharing and Data Security Protocol.

Sharing Data and Information with Other RFMOs

42. The NPFC may share data and information related to transshipments with another regional fisheries management organization (RFMO) if the NPFC has entered into a Memorandum of Understanding with that RFMO and if the RFMO agrees to comply with the NPFC Data Sharing and Data Security Protocol.

Compliance Monitoring

43. Compliance monitoring of all transshipments shall be undertaken in accordance with the CMM *for the Compliance Monitoring Scheme*.
44. The assessment of compliance shall encompass all transshipments within the scope of this measure.

Force Majeure

45. Nothing in this measure prevents a fishing vessel from engaging in a transshipment, or other transfer activity, with another fishing vessel in cases of *force majeure* that threaten the safety of the crew or result in a significant financial loss through fish or fish product spoilage.
46. In the case of *force majeure*, the fishing vessel, or Commission Member or Cooperating non-Contracting Party, shall:
- a) notify the Secretariat prior to the completion of the transshipment, or other transfer activity, as well as the circumstances giving rise to the *force majeure*; and
 - b) provide a transshipment declaration on the transshipment as soon as possible, but within 10 days of the transshipment.

47. The Secretariat shall inform the Commission of each incident of *force majeure* upon receiving notification from the fishing vessel, Commission Member, or Cooperating non-Contracting Party.

Annual Reporting and Review

Annual Reporting

48. Each Commission Member, and Cooperating non-Contracting Party, shall provide an annual summary of the data and information collected from all authorized fishing vessels having undertaken a transshipment, including each year's transshipment declarations, to the Commission at the Technical and Compliance Committee meeting. The summary shall be included in the Annual Report, as per Article 16(3) of the Convention. The template for this summary is included in Annex V.

49. A Commission Member, or Cooperating non-Contracting Party, shall take all reasonable steps to verify the information received from fishing vessels having engaged in a transshipment.

50. Each year, the Secretariat shall produce and present a summary report on the implementation of this measure to the annual meeting of the Technical and Compliance Committee for review. This report shall include summarized information collected from observers, offloading vessels and receiving vessels, and responses from Commission Members and Cooperating non-Contracting Parties on their observer transshipment reports.

51. Commission Members and Cooperating non-Contracting Parties shall investigate instances of potential non-compliance with this measure, and report the results of those investigations to the Commission.

Review of Measure

52. This measure will be reviewed regularly at the Annual Session of the Commission. This review will take into account, *inter alia*:

- a) the latest advice from the Technical and Compliance Committee regarding the effectiveness of this measure in:
 - i) providing the Commission with information about transshipments; and
 - ii) supporting effective monitoring, control, and surveillance activities in line with the obligations of the Convention and conservation and management measures;

Annex AA: CMM 2023-03 on Transshipments

- b) required levels of observer coverage and the potential use of electronic monitoring; and,
- c) the scope and provisions of this measure.

ANNEX I

ADVANCE NOTIFICATION

INSTRUCTIONS

In completing the advance notification, the fishing vessel shall ensure that:

1. the information is as **accurate** as possible, and legible; and
2. the information is provided in **clear, legible print** in accordance with the clarifications below (either by hand or electronically).

CLARIFICATIONS

To assist in the accurate and clear completion of the advance notification:

- use the DD-MM-YYYY format to specify the date (e.g. 01-11-2022);
- use the HH:MM format, and the 24-hour clock (UTC, or specify time zone) to specify the time (e.g. 23:15);
- “NW” is an abbreviation for “national waters”;
- “OTA” is an abbreviation for “other transfer activities”;
- use the Degrees (°) Minutes (′) format to specify the latitude and longitude (e.g. 40° 26′ N, 79° 58′ W);
- for “FAO CODE”, utilize the FAO 3-alpha codes found at www.npfc.int/priority-species, or Fisheries and Aquaculture - All Information Collections - ASFIS List of Species for Fishery Statistics Purposes (fao.org);
 - the Codes for major NPFC species are; SAP (Pacific saury), MAS (chub mackerel), MAA (blue mackerel), JAP (Japanese sardine), OFJ (neon flying squid) and SQJ (Japanese flying squid).
- for “GEOGRAPHIC LOCATION”, state where the fisheries resource (or fisheries resource processed into a product) was taken; and
- for “STATE OF FISH”, state whether the fisheries resource, or product of fisheries resource, is: (1) fresh (FRS), or (2) frozen (FRZ).

ADVANCE NOTIFICATION FOR TRANSSHIPMENTS (1/2)			
PART I – VESSEL INFORMATION			
	INFORMATION	OFFLOADING VESSEL	RECEIVING VESSEL
1	Vessel Name		
2	Flag State		
3	IMO number		
4	IRCS, if eligible, or registration number		
5	Start of Trip		
	Port Name		
	Date of Departure		
6	End of Trip (if known)		
	Port Name		
	Date of Entry		
PART II – INFORMATION ON ANTICIPATED TRANSSHIPMENT			
7	Transshipment Location	<input type="checkbox"/> High Seas, In Convention Area <input type="checkbox"/> High Seas, Outside Convention Area	<input type="checkbox"/> In Port <input type="checkbox"/> NW
	Port Name (if applicable)		
	NW (if applicable)		
	Latitude and Longitude (estimated)	Latitude:	Longitude:
8	Transshipment Start Date (estimated)		
9	Transshipment Start Time (estimated)		
PART III – VERIFICATION			
10	Vessel Master / Vessel Owner or Company		
	Name		
	Nationality		
	Email address (as applicable)		
	Telephone number (as applicable)		
	Signature		
11	Observer (for the receiving vessel only, if applicable)		
	Name		
	Nationality		
	Signature		

ADVANCE NOTIFICATION FOR TRANSSHIPMENTS (2/2)							
In completing this form, ensure the estimated information is as accurate as reasonably possible.							
Weight (kg) or unit used (e.g. box, basket), and the estimated total weight in kg:							
FAO Code	Geographic Location	State of Fish	Type of product (whole, G&G, etc.)	Unit	Kg per unit	Number of Units	TOTAL (kg)

ADVANCE NOTIFICATION FOR OTHER TRANSFER ACTIVITIES			
PART I – VESSEL INFORMATION			
	INFORMATION	OFFLOADING VESSEL	RECEIVING VESSEL
1	Vessel Name		
2	Flag State		
3	IMO Number		
4	IRCS, if eligible, or registration number		
PART II – INFORMATION ON ANTICIPATED OTA			
5	OTA Location	<input type="checkbox"/> High Seas, In Convention Area	
	Latitude and Longitude (estimated)	Latitude:	Longitude:
6	OTA Start Date (estimated)		
7	OTA Start Time (estimated)		
PART III – VERIFICATION			
8	Vessel Master		
	Name		
	Nationality		
	Signature		

ANNEX II

TRANSSHIPMENT DECLARATION

INSTRUCTIONS

In completing the transshipment declaration, the fishing vessel shall ensure that:

1. the information is as **accurate** as possible, and legible; and
2. the information is provided in **clear, legible print** in accordance with the clarifications below (either by hand or electronically).

CLARIFICATIONS

To assist in the accurate completion of the transshipment declaration:

- use the DD-MM-YYYY format to specify the date (e.g. 01-11-2022);
- use the HH:MM format, and the 24-hour clock (UTC, or specify time zone) to specify the time (e.g. 23:15);
- “NW” is an abbreviation for “national waters”;
- use the Degrees (°) Minutes (′) format to specify the latitude and longitude (e.g. 40° 26′ N, 79° 58′ W);
- for “FAO CODE”, utilize the FAO 3-alpha codes found at www.npfc.int/priority-species, or Fisheries and Aquaculture - All Information Collections - ASFIS List of Species for Fishery Statistics Purposes (fao.org);
 - the Codes for major NPFC species are; SAP (Pacific saury), MAS (chub mackerel), MAA (blue mackerel), JAP (Japanese sardine), OFJ (neon flying squid) and SQJ (Japanese flying squid).
- for “GEOGRAPHIC LOCATION”, state where the fisheries resource (or fisheries resource processed into a product) was taken; and
- for “STATE OF FISH”, state whether the fisheries resource, or product of fisheries resource, is: (1) fresh (FRS), or (2) frozen (FRZ).

TRANSSHIPMENT DECLARATION (1/2)			
PART I – VESSEL INFORMATION			
	INFORMATION	OFFLOADING VESSEL	RECEIVING VESSEL
1	Vessel Name		
2	Flag State		
3	IMO number		
4	IRCS, if eligible, or registration number		
5	Vessel Owner or Company (if different from Vessel Master)		
	Name		
	Nationality		
	Phone Number		
	Email		
6	Start of Trip		
	Port Name		
	Date of Departure		
7	End of Trip (if known)		
	Port Name		
	Date of Entry		
PART II – TRANSSHIPMENT INFORMATION			
	INFORMATION	COMMENCEMENT	COMPLETION
8	Transshipment Location	<input type="checkbox"/> High Seas, In Convention Area <input type="checkbox"/> High Seas, Outside CA <input type="checkbox"/> In NW <input type="checkbox"/> In Port	<input type="checkbox"/> High Seas, In Convention Area <input type="checkbox"/> High Seas, Outside CA <input type="checkbox"/> In NW <input type="checkbox"/> In Port
	Port Name (if applicable)		
	NW (if applicable)		
	Latitude		
	Longitude		
9	Transshipment Date		
10	Transshipment Time		
PART III - VERIFICATION			
	INFORMATION	OFFLOADING VESSEL	RECEIVING VESSEL
10	Vessel Master / Vessel Owner or Company		
	Name		
	Nationality		
	Signature		
11	Observer		
	Name		
	Nationality		
	Signature		

TRANSSHIPMENT DECLARATION (2/2)							
PART I – FISHERIES RESOURCES OR PRODUCTS TRANSSHIPPED							
Weight (kg) or unit used (e.g. box, basket) and the estimated total weight in kg:							
FAO Code	Geographic Location	State of Fish	Type of product (whole, G&G, etc.)	Unit	Kg per unit	Number of Units	TOTAL (kg)
PART II – FISHERIES RESOURCES OR PRODUCTS STILL ON OFFLOADING VESSEL (for offloading vessel)							
FAO Code	Geographic Location	State of Fish	Type of product (whole, G&G, etc.)	Unit	Kg per unit	Number of Units	TOTAL (kg)
PART III – FISHERIES RESOURCES OR PRODUCTS CURRENTLY ON RECEIVING VESSEL (for receiving vessel)							
FAO Code	Geographic Location	State of Fish	Type of product (whole, G&G, etc.)	Unit	Kg per unit	Number of Units	TOTAL (kg)

ANNEX III

OBSERVER TRANSSHIPMENT REPORT

INSTRUCTIONS

In completing the observer transshipment report, the fishing vessel shall ensure that:

1. the information is as **accurate** as possible, and legible; and
2. the information is provided in **clear, legible print** in accordance with the clarifications below (either by hand or electronically).

The observer must provide (e.g. as an attachment) the completed transshipment declaration with the completed observer transshipment report. It is the responsibility of the observer to provide sufficient reasoning in order to effectively explain any non-compliance.

CLARIFICATIONS

To assist in the accurate completion of the observer transshipment report:

- use the DD-MM-YYYY format to specify the date (e.g. 01-11-2022);
- use the HH:MM format, and the 24-hour clock (UTC, or specify time zone) to specify the time (e.g. 23:15);
- “NW” is an abbreviation for “national waters”;
- use the Degrees (°) Minutes (′) format to specify the latitude and longitude (e.g. 40° 26′ N, 79° 58′ W);
- for “FAO CODE”, utilize the FAO 3-alpha codes found at www.npfc.int/priority-species, or Fisheries and Aquaculture - All Information Collections - ASFIS List of Species for Fishery Statistics Purposes (fao.org);
- for “GEOGRAPHIC LOCATION”, state where the fisheries resource (or fisheries resource processed into a product) was taken;
- for “STATE OF FISH”, state whether the fisheries resource, or product of fisheries resource, is: (1) fresh (FRS), or (2) frozen (FRZ); and
- “Interruptions” refers to any stoppage in observation of the transshipment by the observer.

OBSERVER TRANSSHIPMENT REPORT (1/1)		
Please ensure that the completed transshipment declaration is attached/provided.		
PART I – OBSERVED TRANSSHIPMENT INFORMATION		
1	Observed (Y/N)	
2	Total Hours Observed	
3	Interruption(s) in Observation (Y/N)	
4	Number of Interruptions	
5	Total Time Interrupted	
PART II - COMMENTARY		
<p>In this section, the observer shall note any observed non-compliance with CMM 2023-03 <i>on Transshipments</i>, including the verification of the consistency of the transshipped quantities (by species) of fisheries resources, or products of fisheries resources.</p>		
PART III - VERIFICATION		
6	Observer	
	Name	
	Nationality	
	Signature	

ANNEX IV

NPFC TRANSSHIPMENT RECORD

In order to facilitate the availability of reporting data and information on transshipments, the following shall be implemented:

Objective

1. The Secretariat shall ensure that all data and information related to transshipments and other transfer activities, including all reporting, is immediately available through the NPFC Transshipment Record to all Commission Members, and Cooperating non-Contracting Parties, upon reception.

General Specifications

2. The NPFC Transshipment Record shall be maintained on, and be accessible through, the secure NPFC website.
3. The NPFC Transshipment Record shall record each transshipment, and other transfer activity, conducted pursuant to this measure.
4. Each transshipment, and other transfer activity, shall be recorded through a profile for the transshipment, or other transfer activity. The profile shall contain:
 - a) the advance notification for each fishing vessel involved;
 - b) the authorization from the relevant coastal or port State authority for each fishing vessel involved, if applicable;
 - c) the transshipment declaration for each fishing vessel involved; and
 - d) if a transshipment, the observer transshipment report.

Specifications for the Record in the Event of Force Majeure

5. If a transshipment, or other transfer activity, is conducted because of *force majeure*, a profile shall be generated and it shall contain:
 - a) the notification of the transshipment, or other transfer activity, and the circumstances giving rise to the *force majeure*; and
 - b) the transshipment declaration.

Direct Entry Scheme

6. The NPFC Transshipment Record shall have a secure direct entry submission webpage to receive:
 - a) advance notifications;
 - b) authorizations from relevant coastal or port States;
 - c) transshipment declarations; and
 - d) observer transshipment reports.
7. The NPFC Transshipment Record shall not accept for submission any advance notification, transshipment declaration, or observer transshipment report that does not satisfy the required data and information.

Integration with the NPFC Vessel Registry

8. Each profile in the NPFC Transshipment Record shall have a link to the NPFC Vessel Registry for each fishing vessel involved in the transshipment, or other transfer activity.
9. Each profile for a fishing vessel in the NPFC Vessel Registry shall have a link to the NPFC Transshipment Record profile of each transshipment, or other transfer activity, that the fishing vessel was involved in.

ANNEX V

INFORMATION TO BE INCLUDED IN THE ANNUAL SUMMARY OF TRANSSHIPMENT

Each Commission Member and Cooperating non-Contracting Party shall include in Part 1 of its Annual Report to the Commission:

- 1.** The total quantities, by weight, of fish stocks covered by this measure that were transshipped by fishing vessels the Commission Member or Cooperating non-Contracting Party is responsible for reporting against, with those quantities broken down by:
 - a)** offloaded and received;
 - b)** transhipped inside the Convention Area, within an EEZ, in port and high seas outside the Convention Area;
 - c)** caught inside the Convention Area and caught outside the Convention Area;
 - d)** species; and,
 - e)** product form.

- 2.** The number of transshipments covered by this measure by fishing vessels that it is responsible for reporting against, broken down by:
 - a)** offloaded and received;
 - b)** transhipped inside the Convention Area, within an EEZ, in port and outside the Convention Area; and
 - c)** caught inside the Convention Area and caught outside the Convention Area.

North Pacific Fisheries Commission BOARDING REPORT		DATE: DD MM YYYY		BOARDING IDENTIFICATION NUMBER		
		/ /				
		BOARDING TIME (UTC)				
		START	FINISH			
		:		:		
VESSEL	MEMBER REGISTRATION NUMBER		VESSEL NAME			
	IMO NUMBER		OTHER UNIQUE IDENTIFIERS (OPTIONAL)			
	NPFC VESSEL ID		LENGTH (METERS)		TONNAGE (GRT or GT)	
	HOMEPORT	FLAG		IRCS		NO. OF CREW
	VESSEL TYPE					
	Purse seine Longline Pole/line Troll Ring net Handline Bunker Carrier Squid jigging Dip net Lift nets Trawl Gillnet Trap Other:					
	LAST PORT OF CALL		DATE	NEXT PORT OF CALL		ESTIMATED DATE
MASTER	MASTER'S NAME (LAST, FIRST and MIDDLE)		JURISDICTION			
	ADDRESS					
	PASSPORT NUMBER AND ISSUING AUTHORITY			BIRTHDATE (DD/MM/YYYY)		
OWNER	OWNER'S NAME (LAST, FIRST and MIDDLE INITIAL)			JURISDICTION		
	ADDRESS			PHONE		
	COMPANY NAME					
	ADDRESS (if different from the owner's)			PHONE (if different from the owner's)		
	OBSERVER ONBOARD		OBSERVER'S NAME		JURISDICTION	
Yes / No						
OBSERVED IN USE						
Fishing / Transshipping / Transiting / Loitering / Supporting: specify _____						
POSITION						
Latitude:		Longitude:		Detailed geographical location:		

Please continue to page 2 of 3.

VERIFICATION				
Vessel documentation checked		Yes / No		
RECORDING OF FISHING EFFORT and CATCHES				
Fishing logbook checked		Yes / No		
Indicate if fishing logbook is:		Paper / Electronic / Both		
Are recordings made in accordance with HSBI CMM regulations		Yes / No		
RECORDING OF TRANSSHIPMENTS		Yes / No		
Description of transshipment reports on board (date, loading/offloading vessel name, species, tonnage, etc.)				
COMPLIANCE WITH NPFC CMMS				
Vessel Registry	Yes / No / N/A	Bottom Fish – NW VME	Yes / No / N/A	
Vessel Markings	Yes / No / N/A	Bottom Fish – NE VME	Yes / No / N/A	
Transshipments	Yes / No / N/A	Chub Mackerel	Yes / No / N/A	
HSBI	Yes / No / N/A	Pacific Saury	Yes / No / N/A	
VMS	Yes / No / N/A	Sablefish NE Pacific	Yes / No / N/A	
		Japanese Sardine and Squids	Yes / No / N/A	
CATCH AMOUNT AND TYPE (SPECIES) ONBOARD				
Summary of total claimed onboard catch				
Effort	Fish Species (with 3-Alpha code)	Catch (metric tonnes)	How Processed (e.g., fresh, frozen, boxed, bagged, etc.)	Discards
Days:				
Sets / Transshipments:				
Result of Inspection of Fish Onboard (Optional):				
Comment in the case of a significant difference between the inspector's estimates of the catches onboard and the related summaries of catches from the logbooks and/or other records. Report any unreported catch or prohibited species found onboard:				

DETAILS OF OBSERVED NON-COMPLIANCES	
Remarks regarding boarding and vessel compliance with Commission Conservation and Management Measures: 	
BOARDING REMARKS	
ENFORCEMENT VESSEL NAME	FLAG
BOARDING OFFICER'S NAME(S)	BOARDING OFFICER'S SIGNATURE
MASTER'S COMMENTS	
MASTER'S NAME (PRINT)	MASTER'S SIGNATURE
<u>PURPOSE OF BOARDING</u>	
<p>The purpose of this boarding report is to document the outcome of at-sea boardings of fishing vessels of Members of the North Pacific Fisheries Commission in accordance with the NPFC Convention and the Commission's Conservation and Management Measure for High Seas Boarding and Inspection</p>	
<u>IMPORTANT NOTICE TO OWNER OR OPERATOR</u>	
<p>Any evidence obtained as a result of a boarding and inspection pursuant to these procedures with respect to a serious violation by a fishing vessel of the Convention or Conservation and Management Measures adopted by the Commission and in force shall be referred to the authorities of the fishing vessel for action in accordance with Article 17 of the Convention.</p>	
<u>SERIOUS VIOLATION</u>	
<p>For the purposes of these procedures, a serious violation means a violation as defined in the NPFC Convention, Article 17, or as defined in any of the Conservation and Management measures (CMMs) adopted by the Commission, e.g., the CMM on Vessels Without Nationality, and the CMM for High Seas Boarding and Inspection, and such other violations as may be determined by the Commission.</p>	

CMM 2023-12

(Entered into force dd mm 2023)

**CONSERVATION AND MANAGEMENT MEASURE
ON THE VESSEL MONITORING SYSTEM (VMS)**

The North Pacific Fisheries Commission,

Recalling Article 2 of the Convention on the Conservation and Management of High Seas Fisheries resources in the North Pacific Ocean (Convention), the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur.

Recognizing Article 7, paragraph 2 (e) of the Convention regarding the development of standards, specifications and procedures for Members of the Commission to report movements and activities using real-time satellite position-fixing transmitters for vessels engaged in fishing activities in the Convention Area and, in accordance with those procedures, coordinate timely dissemination of data collected from Members' satellite vessel monitoring systems,

Reaffirming that Article 13, paragraph 1 of the Convention that Members of the Commission or Cooperating Non-Contracting Parties (CNCPS) shall take necessary measures to ensure that fishing vessels entitled to fly their flag operating in the Convention Area comply with the provisions of the Convention and measures adopted pursuant to the Convention and such vessels do not engage in any activities that undermine the effectiveness of such measures and do not conduct unauthorized fishing activities within areas under national jurisdiction of another State adjacent to the Convention Area,

Determined to ensure effective monitoring, control and surveillance (MCS) and to address the challenge of illegal, unreported and unregulated (IUU) fishing in the Convention Area,

Adopts the following conservation and management measure (CMM) in accordance with Article 7 of the Convention:

Definitions

1. For the purpose of this CMM, the following definitions apply:

- a) "Convention" means the Convention on the Conservation and Management of High Seas Fisheries resources in the North Pacific Ocean.

Annex CC: CMM 2023-12 on the Vessel Monitoring System (VMS)

- b) “Convention Area” means the area of the high seas areas of the North Pacific Ocean as specified in Article 4 of the Convention.
- c) “Commission” means the North Pacific Fisheries Commission (NPFC) established under Article 5 of the Convention.
- d) “Fishing activities” means the activities established under Article 1 (i) of the Convention.
- e) “Fisheries monitoring center (FMC)” means the authorized authority or agency of a Member or CNCP responsible for managing VMS for its flagged fishing vessels.
- f) “Fishing vessels” means any vessel described under Article 1 (j) of the Convention.
- g) “Inspection Presence in the Convention Area” means the Member is authorized by the High Seas Boarding Inspection Procedure to conduct inspections and is planning for or actively engaged in surveillance in the Convention Area.
- h) “Manually report” means the transmission via any alternative means of the date/time, current geographical position (latitude and longitude) when an MTU fails to transmit VMS data.
- i) “Mobile transmitting unit (MTU)” means a satellite communication device capable of receiving and transmitting VMS data.
- j) “VMS” means a satellite-based monitoring system that transmits VMS data from MTUs on fishing vessels to FMCs.
- k) “VMS data” means data transmitted by an MTU including:
 - i) MTU unique identifier;
 - ii) the current geographical position (latitude and longitude) of the vessel (accurate to within 100m); and,
 - iii) the date and time (expressed in Coordinated Universal Time (UTC)) of the fixing of the position of the vessel in paragraph 1(k)(ii).

Purpose

2. The VMS supports the Convention’s objective to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area. The VMS forms an important part of the Commission’s MCS regime to ensure compliance with, and enforcement of, the provisions of the Convention and CMMs. The purpose of the VMS is to continuously monitor the positions and movements of all fishing vessels in the Convention Area for compliance purposes. VMS data may also be used to support scientific processes as agreed by the Commission.

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Application

3. The VMS applies to all authorized NPFC vessels in the Convention Area.
4. A Member or CNCP may request that waters under their jurisdiction be also covered by the VMS. This request shall be provided to the Commission for their consideration and approval.
Mobile transmitting units (MTUs)

Mobile Transmitting Units (MTUs)

5. Each Member or CNCP shall ensure that its vessels authorized pursuant to the relevant CMM for Vessel Registration under NPFC in the Convention Area are equipped with an MTU that complies with the guidance on minimum standards for MTUs contained in Annex 1.
6. Each Member or CNCP shall ensure that MTUs are installed on their flagged fishing vessels in the Convention Area in accordance with relevant domestic legal obligations, procedures and conditions.

VMS Data Transmission Requirements

7. Each Member or CNCP shall ensure its authorized NPFC vessels provide accurate VMS data to the Secretariat via its FMC, in accordance with this CMM.
8. All Members or CNCPs shall ensure that its flagged vessels that are authorized under NPFC and present in the Convention Area transmit VMS data every hour to their FMC.
9. A Member or CNCP may require its fishing vessels to transmit VMS data directly to the Secretariat.
10. Each Member or CNCP shall ensure that their FMC automatically transmits VMS data to the Secretariat, which shall be received no later than 60 minutes upon receipt of the data at their FMC.

Fisheries Monitoring Centers (FMCs)

11. Each Member or CNCP shall ensure that their FMC can automatically receive VMS data and transmit VMS data to the Secretariat.

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12. Each Member or CNCP shall provide the Secretariat with VMS contact points in their FMCs including the name, position, email address and phone number of their VMS contact points. The Secretariat will make a list of VMS contact points available to all Members and Cooperating non-Contracting Parties.

Data Access and Use

13. All VMS data received by the Secretariat shall be treated as confidential information in accordance with NPFC's Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) Data (Annex 2).
14. In accordance with the NPFC's Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) (Annex 2), the Secretariat shall provide VMS data:
 - a) By electronic means to a Member who has an inspection presence in the Convention Area;
or
 - b) upon request from a Member to support search and rescue (SAR)

Data Sharing, Security and Integrity

15. In accordance with NPFC's Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) Data (Annex 2), VMS data shall only be accessed and used for the purposes included in this measure or for any other purposes as agreed by the Commission.
16. MTUs on fishing vessels shall be tamper-proof so as to preserve the security and integrity of VMS data.

VMS Data Transmission Failure

17. In the event that an MTU has failed to transmit VMS data for four hours, the flag Member or CNCP shall require the fishing vessel master to manually report every four hours to the FMC or the Secretariat by other means of communication.
18. A Member or CNCP may also require its fishing vessels to manually report directly to the Secretariat.
19. The flag Member or CNCP shall require an MTU that fails to transmit VMS data in accordance with this measure, be repaired or replaced as soon as possible and, in any event, within thirty (30) days of the VMS data transmission failure.

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20. If the fishing vessel returns to port following an MTU VMS data transmission failure, the Member or CNCP shall not permit the vessel to undertake fishing in the Convention Area until the MTU has been replaced in accordance with the guidance in Annex 1 or is repaired and is able to transmit VMS data.
21. If a Member or CNCP finds that an MTU has failed to transmit VMS data for twelve hours, the Member or CNCP shall immediately notify the fishing vessel master, owner or authorized representative of this failure.
22. If a failure to transmit occurs more than two times within a period of one year, the flag Member or CNCP of the fishing vessel shall investigate the matter, including having an authorized official examine the MTU on board the vessel. The outcome of this investigation shall be forwarded to the Secretariat within fifteen (15) days of its completion.

Research Vessels

23. Notwithstanding the requirements in this CMM, research vessels operated by authority of a Member may use AIS for their position reporting. Such research vessels shall make their positions available via AIS at all times while engaging in research operations in the Convention Area. In the event of AIS data transmission failure, the research vessel is required to take steps as stipulated in paragraphs 16-21 mutatis mutandis. The flag Members of research vessels that make position reporting via AIS in accordance with this paragraph shall submit to the Secretariat relevant information (vessel name, MMSI number, abstract of research activities, etc.) 30 days prior to the initiation of their research activities. This paragraph will expire at the end of the 8th Commission meeting unless the Commission decides otherwise.

Review

24. The Secretariat shall report on the implementation of this measure annually to the Technical and Compliance Committee (TCC). The TCC shall review the implementation of the VMS after two years and make recommendations to the Commission as may be necessary.

Guidance on minimum standards for mobile transmitting units (MTUs)

1. The mobile transmitting unit (MTU) shall automatically and independently of any intervention by the fishing vessel, transmit VMS data as required by NPFC.
2. The VMS data shall be obtained from a satellite-based positioning system.
3. MTUs on fishing vessels must be capable of transmitting VMS data at least every fifteen minutes.
4. MTUs on fishing vessels must be tamper-proof so as to preserve the security and integrity of VMS data.
5. Storage of VMS data and other relevant information within the MTU must be safe, secure and integrated within a single unit under normal operating conditions.
6. It must not be reasonably possible for anyone, other than the Fisheries Monitoring Centre (FMC), to alter any of the VMS data stored in an MTU, including the frequency of position VMS data transmission to the FMC.
7. Any features built into the MTU or its software to assist with servicing shall not allow unauthorized access to the MTU that could potentially compromise the operation of the VMS.
8. MTUs shall be installed on fishing vessels by an authorized installer in accordance with the manufacturer's specifications and applicable standards and in accordance with a flag State's relevant domestic legal obligations, procedures and conditions.
9. Under normal satellite navigation operating conditions, VMS data must include the geographical location of a fishing vessel within an accuracy of 100 meters.
10. The MTU and/or the VMS service provider must be able send VMS data to multiple independent destinations.
11. The MTU and its component parts shall be fully integrated and housed in the same tamperproof physical enclosure.
12. The MTU must have:
 - a) all components sealed by the manufacturer; or

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- b) official seals¹, individually identified with unique serial numbers, applied.
13. Relevant domestic legal obligations, procedures and conditions for MTU installation on fishing vessels should be forwarded by members and cooperating non-Contracting Parties to the Secretariat or made available upon request.
14. The MTU must have an alternate power unit, to act as a backup in case of failure of the main power, to enable the MTU to continue to meet the VMS data transmission requirements of this CMM.
15. The MTU should include audible or visible alarms to indicate a unit malfunction.

¹ Official seals or other mechanisms must be of such a type to indicate whether the MTU has been accessed or tampered with.

NPFC Data-Sharing and Data-Security Protocol for Vessel Monitoring System (VMS) Data

Definitions

1. For the purpose of this Protocol, unless specifically defined herein, words and terms have the same meaning as in the Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean (Convention) and any conservation and management measures (CMMs) adopted by the North Pacific Fisheries Commission (Commission or NPFC), including in particular the CMM on the Vessel Monitoring System (VMS).
 - a) “Confidential” refers to non-public domain data and information held by Commission Members, the Secretariat, and by service providers contracted by the Commission, or contractors acting on their behalf, that is to be kept private, and shall not be accessed, released or disclosed unless such access, release or disclosure is for the purposes described in, and authorized by, this Protocol;
 - b) “Scientific purposes” may include estimating distribution of fishing effort for use in the Commission’s research activities; planning for and implementing tagging programmes; modelling fishing effort for use in fisheries management activities, including management strategy evaluation (MSE); estimating abundance indices or undertaking stock assessments; validating logbook data; and, any other scientific purposes agreed to by the Commission.

Purpose

2. The purpose of this Protocol is to implement Article 16, paragraph 4 of the Convention, which states, “The Commission shall establish rules to ensure the security of, access to and dissemination of data, including data reported via real-time satellite position-fixing transmitters, while maintaining confidentiality where appropriate and taking due account of the domestic practices and domestic laws of members of the Commission.”

Scope of Application

3. This Protocol applies to VMS data transmitted to, received by, stored, and, used by the Secretariat, the Commission and its Members, and authorized contractors, from authorized NPFC vessels in the Convention Area.

Annex CC: CMM 2023-12 on the Vessel Monitoring System (VMS)

General Provisions

Accountability and Control System

4. All VMS data shall be considered confidential.
5. It is the responsibility of each Commission Member, and the Secretariat, to take all necessary measures to comply with this Protocol when transmitting and receiving VMS data.
6. Prior to accessing VMS data, authorized contractors shall be informed that VMS data is confidential and shall sign the Confidentiality Agreement (attached as Appendix 1) stipulating that they have been informed that the VMS data is confidential and that they have reviewed, are familiar with, and agree to the procedures to protect confidential VMS data set forth in the Confidentiality Agreement.
7. Where VMS data is transmitted by the Secretariat, with the approval of the Commission, to a party not already authorized to receive VMS data in accordance with this protocol, the Secretariat shall remain responsible for such data. The third party must receive written authorization from Secretariat to receive VMS data and shall be required to sign the Confidentiality Agreement (attached as Appendix 1). Breach of the Confidentiality Agreement constitutes breach of this Protocol, and will result in access to confidential VMS data being revoked, until corrective actions deemed appropriate by the Commission and the Secretariat have been taken. The third party will maintain the data provided to it in a manner no less stringent than the security standards established by the Commission.
8. The Executive Secretary will report to the Commission annually on the compliance with this Protocol, including any breach thereof.

Data Purposes

9. All VMS data collection, access, storage, use, and dissemination shall only be undertaken for the purposes of monitoring, control, and surveillance in the Convention Area, supporting search and rescue operations, and fulfilling the functions of the Commission, as established in Article 7(1) and (2) of the Convention, including scientific purposes as defined above, and subject to any additional relevant regulations, protocols, CMMs or policies approved by the Commission.

Safeguards

10. All authorized personnel having access to VMS data are prohibited from unauthorized use or disclosure of such data.

Annex CC: CMM 2023-12 on the Vessel Monitoring System (VMS)

11. All VMS data shall be protected against loss or theft, as well as unauthorized access, dissemination, copying, use, or modification, by security safeguards, in accordance with the Data Retention and Security Section of this Protocol.

Data Access and Use

12. VMS data should only be accessed and/or used by authorized personnel in the Secretariat, authorized MCS entities and personnel, and authorized contractors, for the identified purposes in this Protocol or for other purposes identified by the Commission.
13. The Secretariat shall not make VMS data available to a Member where the Commission has established that the Member has not complied with this Protocol, or the CMM for VMS.

Use for Inspection Presence in Convention Area

14. For a Member who has an Inspection Presence in the Convention Area, VMS data shall be made available electronically in accordance with the following provisions:
 - a) Each Member shall identify a point of contact for VMS data;
 - b) Each Member who has an Inspection Presence in the Convention Area shall provide the Secretariat with the geographic area (in multiples of 10 degrees latitude and longitude with a north and south latitude boundary and an east and west longitude boundary) of the planned boarding and inspection MCS activities at least 72 hours in advance, when practicable;
 - c) Without prejudice and pursuant to CMM 2023-09, and following the notification process outlined above, the Secretariat shall make VMS data available electronically for the area defined in paragraph 14 b) as it is received, to each Member who has an Inspection Presence in the Convention Area. The provisions of this paragraph shall expire at the end of the next scheduled Commission meeting.
 - d) Each Member who has an Inspection Presence in the Convention Area shall only make VMS data available to authorities or inspectors, as defined in the CMM for High Seas Boarding and Inspection Procedures for the North Pacific Fisheries Commission (NPFC) responsible for fisheries monitoring, control, and surveillance activities in the Convention Area unless the data is being used in an investigation, or a judicial, or administrative proceeding, and subject to any relevant domestic laws and policies, and has requested VMS data in support of HSBI/MCS activities.
15. Where the fishing vessel to which the VMS data pertains has been involved in an alleged violation of a CMM, the Convention, or domestic laws or regulations, the VMS data pertaining to the alleged violation may be retained, and the Secretariat will be notified, by Members who have an inspection presence in the Convention Area until appropriate proceedings, including investigations, and judicial or administrative proceedings, have concluded.

Annex CC: CMM 2023-12 on the Vessel Monitoring System (VMS)

16. Should no VMS data be retained pursuant to paragraph 15, each Member who has an Inspection Presence in the Convention Area shall delete all VMS data received from the Secretariat within seven days following the completion of monitoring, control, and surveillance activities in the Convention Area. The Member shall also submit a written confirmation to the Secretariat of the deletion of the VMS data within seven working days following the completion of monitoring, control, and surveillance activities.

Use for Search and Rescue Operations

17. For the purpose of supporting search and rescue operations by a Commission Member, the Secretariat shall make VMS data available upon request from a Member.

Data Retention and Security

Data Retention

18. All VMS data transmitted to the Secretariat in accordance with the Convention and CMMs shall be retained by the Secretariat.
19. Each Commission Member shall retain VMS data for fishing vessels flying its flag for at least one year.

Data Security

20. Each Commission Member and the Executive Secretary shall ensure the security of VMS data in their respective electronic data processing facilities, particularly where the use of VMS data involves transmission over a network.
21. Security measures must be appropriate to the level of risk posed by the transmission, processing, and storage of VMS data. At a minimum, the following security requirements must be implemented prior to transmitting or receiving VMS data:
 - a) The Executive Secretary shall ensure that regional system access to VMS data under its control is protected such that all data that enters the system is securely stored and will not be accessed by or tampered with from unauthorized individuals by implementing, at minimum, the following measures:
 - i) physical access to the computer system which transmits, uses, and stores VMS data is controlled;
 - ii) each user of the system is assigned a unique identification and associated password, and each time the user logs on to the system, he or she must provide the correct

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password;

- iii) user access shall be audited annually for analysis and detection of security breaches; and
 - iv) each user shall be given access only to the data necessary for his or her task.
- b) Data exchange protocols for electronic transmission of VMS data between Commission Members and the Secretariat shall be duly tested by the Secretariat and periodically reviewed by the Commission. Electronic transmission is subject to security procedures established in this Protocol.
- c) Appropriate encryption protocols duly tested by the Secretariat and periodically reviewed by the Commission shall be applied by authorized contractors, including the use of cryptographic techniques to ensure confidentiality and authenticity.
- d) Security procedures shall be designed by authorized contractors addressing access to the system hardware and software, system administration and maintenance, backup, and general usage of the system. Each Commission Member, and the Executive Secretary, shall ensure proper maintenance of system security and restrict access to the system accordingly. Each Commission Member shall liaise with the Secretariat in order to identify and resolve any security breaches or issues.

**Confidentiality Agreement
For Accessing North Pacific Fisheries Commission (NPFC) Confidential Vessel Monitoring
System (VMS) Data**

Applicant Name, contact information, and signature:

Full Name	Agency/Organization, Address, Email, and Phone	Signature and Date

In return for the NPFC Secretariat granting me access to confidential NPFC VMS data, I hereby make the following declarations and promises:

1. I am (check the appropriate box):
 - a. a contractor employed by the NPFC, or one of its Members, whose official duties require access to confidential VMS data.
 - b. an employee of an organization, which the NPFC Secretariat has authorized in writing to receive confidential VMS data.
2. I am requesting access to confidential NPFC VMS data:
 - a. for the following purposes (provide a detailed explanation, attaching an additional sheet if necessary):
 - b. on behalf of the following organization: _____.
3. I have read and understood the NPFC Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) Data (“Protocols”). I understand that the VMS data I am requesting are confidential, as defined in the Protocols. I agree to abide by the provisions of the Protocols that address protecting and safeguarding confidential VMS data.
4. I agree to abide by any additional written conditions regarding the use of confidential VMS data the Secretariat attaches to this Confidentiality Agreement.

Annex CC: CMM 2023-12 on the Vessel Monitoring System (VMS)

5. I agree to abide by the NPFC Data Sharing and Data Security Protocols.
6. I agree that the confidential VMS data shall be used only for the purposes for which I am requesting the data, be accessed only by me and other individuals who have signed a Confidentiality Agreement, and be destroyed upon completion of the usage for which the data are being requested. I further agree to report the destruction of the confidential VMS data to the Secretariat.
7. I agree to make no unauthorized copies of the requested confidential VMS data. If a copy of all, or part, of the data is made by me, all copies, and/or parts thereof, will be registered with the Secretariat and will be destroyed upon completion of the purpose for which I requested the data.
8. Prior to the publication of any report in which I intend to use requested confidential VMS data, I agree to provide the report to the Secretariat for clearance to ensure that no confidential VMS data will be published.
9. I agree to provide a copy of any published reports referenced in paragraph 8 to the Secretariat.
10. I agree not to disclose, divulge, or transfer, either directly or indirectly, the requested confidential VMS data to any third party without the prior written consent of the Secretariat.
11. I agree to promptly notify the Secretariat, in writing, of any unauthorized or inadvertent disclosure of confidential VMS data.
12. I assume all liability, if any, with respect to my breach of this Confidentiality Agreement after I receive the requested confidential VMS data.
13. In the event of my breach of this Confidentiality Agreement, I understand that the Secretariat will not grant me access to confidential VMS data until corrective actions deemed appropriate by the Secretariat have been taken by me, my employer, or by the Member under whose supervision I work.

This Agreement is effective on the date indicated below upon signature of an authorized representative of the Secretariat.

Authorized NPFC Secretariat Representative

Date

Resolution 2023-01
(Entered into force dd mm 2023)

RESOLUTION ON CLIMATE CHANGE

The North Pacific Fisheries Commission,

Noting that several regional fisheries management organizations have taken recent steps to recognize the importance of preparing for the emerging impacts of climate change on the fisheries under their jurisdiction, including International Commission for the Conservation of Atlantic Tunas, Indian Ocean Tuna Commission, Western and Central Pacific Fisheries Commission, Commission for the Conservation of Antarctic Marine Living Resources, and South Pacific Regional Fisheries Management Organization;

Noting also that the UN General Assembly's Sustainable Fisheries Resolution (A/RES/77/118) calls upon States and regional fisheries management organizations and arrangements, as appropriate, to assess the risks and potential adverse impacts of climate change with respect to fish stocks and consider them when establishing conservation and management measures and identifying options to reduce risks and adverse impacts with respect to fisheries management and the health and resilience of marine ecosystems;

Emphasizing that climate change is leading to potential shifts in the distribution and abundance of global fisheries, altering ecosystems, and affecting livelihoods and food systems worldwide;

Acknowledging that the North Pacific Fisheries Commission (NPFC) does not currently have provisions to analyze and address the potential impacts from climate change on the fisheries under its jurisdiction through the Commission or its subsidiary bodies;

Recalling the NPFC–PICES Framework for Enhanced Scientific Collaboration in the North Pacific, which prioritizes climate change and suggests its integration into work on stock assessments for priority species, the conservation of vulnerable marine ecosystems, and an ecosystem approach to fisheries;

Recognizing the need to develop a comprehensive approach to understanding and addressing the impacts of climate change on fishery resources in the Convention Area,

Annex DD: Resolution 2023-01 on Climate Change

NPFC resolves to:

1. Consider where appropriate the potential impacts of climate change on NPFC fisheries resources and related ecosystems in the Convention Area, related fishing activities, as well as any related socio-economic impacts.
2. Take into account in relevant deliberations, including in the development of conservation and management measures to the extent possible, the best available scientific information and advice, particularly from the Scientific Committee (SC), on the potential impacts of climate change on target stocks, non-target species, and species belonging to the same ecosystem or dependent on or associated with target stocks, with a view to adapting to changing conditions and improving the resilience of these stocks, species, related ecosystems, and fisheries.
3. Task the SC to identify relevant data availability and needs and integrate analyses of climate change relevant to NPFC fisheries into its work plan. The SC will consider to the extent possible key vulnerabilities and management implications of changing oceanographic conditions resulting from climate change on NPFC fisheries resources and species belonging to the same ecosystem or dependent upon or associated with target stocks, including the impacts on overfished stocks and vulnerable marine ecosystems. The SC will discuss how best to incorporate existing climate change data and analyses in its work as well as other information that may be needed to assess the impact of climate change on the fisheries managed by NPFC.
4. Include climate change as a standing agenda item of meetings of the Commission, SC, and TCC.

CMM 2023-05

(Entered into force xx xx 2023)

**CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE
ECOSYSTEMS IN THE NORTHWESTERN PACIFIC OCEAN**

The North Pacific Fisheries Commission (NPFC),

Strongly supporting protection of vulnerable marine ecosystems (VMEs) and sustainable management of fish stocks based on the best scientific information available;

Recalling the United Nations General Assembly Resolutions (UNGA) on Sustainable Fisheries, particularly paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, and paragraphs 69 and 80 to 91 of UNGA61/105 in 2006;

Noting, in particular, paragraphs 66 and 69 of UNGA59/25 that call upon States to take action urgently to address the issue of bottom trawl fisheries on VMEs and to cooperate in the establishment of new regional fisheries management organizations or arrangements;

Recognizing further that fishing activities, including bottom fisheries, are an important contributor to the global food supply and that this must be taken into account when seeking to achieve sustainable fisheries and to protect VMEs;

Recognizing the importance of collecting scientific data to assess the impacts of these fisheries on marine species and VMEs;

Concerned about possible adverse impacts of unregulated expansion of bottom fisheries on marine species and VMEs in the western part of the Convention Area.

Adopts the following Conservation and Management Measure:

1. Scope

A. Coverage

These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northwestern Pacific Ocean, defined, for the purposes of this document, as those

occurring in the Convention Area as set out in Article 4 of the Convention text to the west of the line of 175 degrees W longitude (here in after called “the western part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

B. Management target

Bottom fisheries conducted by vessels operating in the western part of the Convention Area.

2. General purpose

Sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area.

The objective of these Measures is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur.

These measures shall set out to prevent significant adverse impacts on VMEs in the Convention Area of the North Pacific Ocean, acknowledging the complex dependency of fishing resources and species belonging to the same ecosystem within VMEs.

The Commission shall re-evaluate, and as appropriate, revise, the definition based on further consideration of the work done through FAO and by NPFC.

3. Principles

The implementation of this CMM shall:

- (a) be based on the best scientific information available,
- (b) be in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
- (c) establish appropriate and effective conservation and management measures,
- (d) be in accordance with the precautionary approach, and
- (e) incorporate an ecosystem approach to fisheries management.

4. Measures

Members of the Commission shall take the following measures in order to achieve sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area:

- A. Limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
- B. Not allow bottom fisheries to expand into the western part of the Convention Area where no such fishing is currently occurring, in particular, by limiting such bottom fisheries to seamounts located south of 45 degrees North Latitude and refrain from bottom fisheries in other areas of the western part of the Convention Area covered by these measures and also not allow bottom fisheries to conduct fishing operation in areas deeper than 1,500m.
- C. Notwithstanding subparagraphs A and B above, exceptions to these restrictions may be provided in cases where it can be shown that any fishing activity beyond such limits or in any new areas would not have significant adverse impacts (SAIs) on marine species or any VME. Such fishing activity is subject to an exploratory fishery protocol (Annex 1).
- D. Any determinations pursuant to subparagraph C that any proposed fishing activity will not have SAIs on marine species or any VME are to be in accordance with the Science-based Standards and Criteria (Annex 2), which are consistent with the FAO International Guidelines for the Management of Deepsea Fisheries in the High Seas.
- E. Any determinations, by any flag State or pursuant to any subsequent arrangement for the management of the bottom fisheries in the areas covered by these measures, that fishing activity would not have SAIs on marine species or any VMEs, shall be made publicly available through agreed means.
- F. Prohibit its vessels from engaging in directed fishing on the following taxa: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, the classes of *Hexactinellida* and *Demospongiae* in the phylum Porifera as well as any other indicator species for VMEs as may be identified from time to time by the SC and approved by the Commission.
- G. Further, considering accumulated information regarding fishing activities in the western part of the Convention Area, in areas where, in the course of fishing operations, cold water corals more than 50Kg or sponges more than 500Kg are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease

bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 1 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species, shall be reported to the Secretariat, through the Member, within one business day. The Executive Secretary shall, within one business day, notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit bottom fishing vessels from contacting the sea floor with their trawl nets. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the VME indicator taxa include cold water corals *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, and the classes of *Hexactinellida* and *Demospongiae* in the phylum Porifera.

- H. Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.
- I. C-H seamount and Southeastern part of Koko seamount, specifically for the latter seamount, the area South of 34 degrees 57 minutes North, East of the 400m isobaths, East of 171 degrees 54 minutes East, North of 34 degrees 50 minutes North, are closed precautionary for potential VME conservation. Fishing in these areas requires exploratory fishery protocol (Annex 1).
- J. Ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm.
- K. Apply a bottom fisheries closure from November to December.
- L. Limit annual catch of North Pacific armorhead to 15,000 tons for Japan. In years when strong recruitment of North Pacific armorhead is not detected by the monitoring survey (Annex 6), the Commission encourages Japan to limit their catch of North Pacific armorhead by vessels flying its flag to 500 tons, and encourages Korea to limit their catch of North Pacific armorhead by vessels flying its flag to 200 tons. When a strong

recruitment of North Pacific armorhead is detected by the monitoring survey (Annex 6), the Commission encourages that Japan limit the annual catch of North Pacific armorhead by vessels flying its flag to 10,000 tons, and that Korea limit the annual catch of North Pacific armorhead by vessels flying its flag to 2,000 tons. The Commission encourages that catch overages for any given year be subtracted from the applicable annual catch limit in the following year, and that catch underages during any given year not be added to the applicable annual catch limit during the following year.

- M. During a year when high recruitment is detected, bottom fishing with trawl gear shall be prohibited in specific areas in the Emperor seamounts where half of the catch occurred in 2010 and 2012 (Annex 6). Determination of a strong recruitment year and of the specific areas where bottom fishing with trawl gear is prohibited shall be communicated to all Members and Cooperating Non-Contracting Parties following the procedure specified in Annex 6.
- N. Catch in the monitoring surveys shall not be included in the catch limits specified in paragraphs M and N but shall be reported to the Secretariat.
- O. Development of new fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members without documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area shall be determined in accordance with relevant provisions, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.
- P. Fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members with documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area is not precluded.
- Q. Members shall require vessels flying their flags to use trawl nets with mesh size greater than or equal to 130mm of stretched mesh with 5kg tension in the codend when conducting fishing activities for North Pacific armorhead or splendid alfonsino.
- R. Task the Scientific Committee with reviewing the appropriate methods for establishing catch limits, and the adequacy and practicability of the adaptive management plan described in subparagraphs K, L, M, N, O, P, Q and Annex 6 from time to time and recommending revisions and actions, if necessary.

- S. Prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets in the following two sites with VME indicator species. A Member of the Commission whose fishing vessels entered these areas shall report to the TCC as to how it ensured the compliance of this measure.

Sites with VME indicator species (Areas surrounded by the straight lines linking the 4 geographical points below)

Northwestern part of Koko Seamount	35-44.75 N 171-07.60 E	35-44.75 N 171-07.80 E
	35-43.80 N 171-07.80 E	35-43.80 N 171-08.00 E
Northern Ridge of Colahan Seamount	31-03.85 N 175-53.40 E	31-03.85 N 175-53.65 E
	31-03.5 N 175-53.50 E	31-03.05 N 175-53.85 E

5. Contingent Action

Members of the Commission shall submit to the SC their assessments of the impacts of fishing activity on marine species or any VMEs, including the proposed management measures to prevent such impact. Such submissions shall include all relevant data and information in support of any such assessment. Procedures for such reviews including procedures for the provision of advice and recommendations from the SC to the submitting Member are attached (Annex 3). Members will only authorize bottom fishing activity pursuant to para 4 (C).

6. Scientific Information

To facilitate the scientific work associated with the implementation of these measures, each Member of the Commission shall undertake:

A. Reporting of information for purposes of defining the footprint

In implementing paragraphs 4A and 4B, the Members of the Commission shall provide for each year, the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, and areas fished (names of seamounts) to the Secretariat. The Secretariat shall circulate the information received to the other Members consistent with the approved Regulations for Management of Scientific Data and Information. To support assessments of the fisheries and refinement of conservation and management measures, Members of the Commission are to provide updated information on an annual basis.

B. Collection of information

- (i) Collection of scientific information from each bottom fishing vessel operating in the western part of the Convention Area.

- (a) Catch and effort data
- (b) Related information such as time, location, depth, temperature, etc.
- (ii) As appropriate, the collection of information from research vessels operating in the western part of the Convention Area.
 - (a) Physical, chemical, biological, oceanographic, meteorological, etc.
 - (b) Ecosystem surveys.
 - (c) Seabed mapping (e.g. multibeam or other echosounder); seafloor images by drop camera, remotely operated underwater vehicle (ROV) and/or autonomous underwater vehicle (AUV).
- (iii) Collection of observer data

Duly designated observers from the flag member shall collect information from bottom fishing vessels operating in the western part of the Convention Area. Observers shall collect data in accordance with Annex 5. Each Member of the Commission shall submit the reports to the Secretariat in accordance with Annex 4. The Secretariat shall compile this information on an annual basis and make it available to the Members of the Commission.

7. Control of bottom fishing vessels

To strengthen its control over bottom fishing vessels flying its flag, each Member of the Commission shall ensure that all such vessels operating in the western part of the Convention Area be equipped with an operational vessel monitoring system.

8. Observers

All vessels authorized to bottom fishing in the western part of the Convention Area shall carry an observer on board.

EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.
2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:
 - (i) precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
 - (ii) precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
 - (iii) regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
 - (iv) measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
 - (v) comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.
3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:
 - (i) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.
 - (ii) The assessment in (i) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.
 - (iii) The SC is to review the information and the assessment submitted in (i) above in accordance with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”
 - (iv) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the

Annex EE: CMM 2023-05 BF VME NWPO

basis of comments and recommendations of SC. Any determinations, by any Member of the Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.
5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.
6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.
7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.
8. The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4(1)(a).

Appendix 1.1

Information to be provided before exploratory fisheries start

1. A harvesting plan
 - Name of vessel
 - Flag member of vessel

- Description of area to be fished (location and depth)
- Fishing dates
- Anticipated effort
- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

2. A mitigation plan

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

3. A catch monitoring plan

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

4. A data collection plan

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

Appendix 1.2

Information to be included in the report

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES

1. Introduction

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

2. Purpose

- (1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities¹ on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the Commission.
- (2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as follows:

¹ “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.

- (a) The fisheries are conducted in the Convention Area;
- (b) The total catch (everything brought up by the fishing gear) includes species that can only sustain low exploitation rates; and
- (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations.

3. Definition of VMEs

- (1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold-water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.
- (2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).
- (3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.
 - (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
 - (i) Habitats that contain endemic species;
 - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
 - (iii) Nurseries or discrete feeding, breeding, or spawning areas.
 - (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.
 - (c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities

- (d) Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:
 - (i) Slow growth rates
 - (ii) Late age of maturity
 - (iii) Low or unpredictable recruitment
 - (iv) Long-lived
 - (e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.
- (4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. That is, whether the ecological unit is the entire Area, or the current fishing ground, namely, the Emperor Seamount and Northern Hawaiian Ridge area (hereinafter called “the ES-NHR area”), or a group of the seamounts within the ESNHR area, or each seamount in the ES-NHR area, is to be decided using the above criteria.

4. Identification of potential VMEs

(1) Fished seamounts

(a) Identification of fished seamounts

It is reported that four types of fishing gear are currently used by the members of the Commission in the ES-NHR area, namely, bottom trawl, bottom gillnet, bottom longline and pot. A fifth type of fishing gear (coral drag) was used in the ES-NHR area from the mid-1960s to the late 1980s and is possibly still used by non-members of the Commission. These types of fishing gear are usually used on the top or slope of seamounts, which could be considered VMEs. It is therefore necessary to identify the footprint of the bottom fisheries (fished seamounts) based on the available fishing record. The following seamounts have been identified as fished seamounts: Suiko, Showa, Youmei, Nintoku, Jingu, Ojin, Northern Koko, Koko, Kinmei, Yuryaku, Kammu, Colahan, and CH. Since the use of most of these gears in the ES-NHR area dates back to the late 1960s and 1970s, it is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may

be physically unsuitable for certain fishing gears. Thus, it is important to know actual fished areas within the same seamount so as to know the gravity of the impact of fishing activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

5. Assessment of SAIs on VMEs or marine species

(1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.

(2) When determining the scale and significance of an impact, the following six factors are to be considered:

- (a) The intensity or severity of the impact at the specific site being affected;
- (b) The spatial extent of the impact relative to the availability of the habitat type affected;
- (c) The sensitivity/vulnerability of the ecosystem to the impact;
- (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;

- (e) The extent to which ecosystem functions may be altered by the impact; and
- (f) The timing and duration of the impact relative to the period in which a species needs

the habitat during one or more life-history stages.

(3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

(4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.

(5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:

- (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
- (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
- (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;
- (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
- (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
- (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.

(6) Impact assessments are to consider, as appropriate, the information referred to in these Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.

(7) Where an assessment concludes that the area does not contain VMEs or that significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

Annex 2.1

Examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which may contribute to forming VMEs:	
a.	certain cold-water corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), black corals (antipatharia), and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyophores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and
d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities referred to above:

- a. submerged edges and slopes (e.g., corals and sponges)
- b. summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges and xenophyphores)
- c. canyons and trenches (e.g., burrowed clay outcrops, corals),
- d. hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
- e. cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

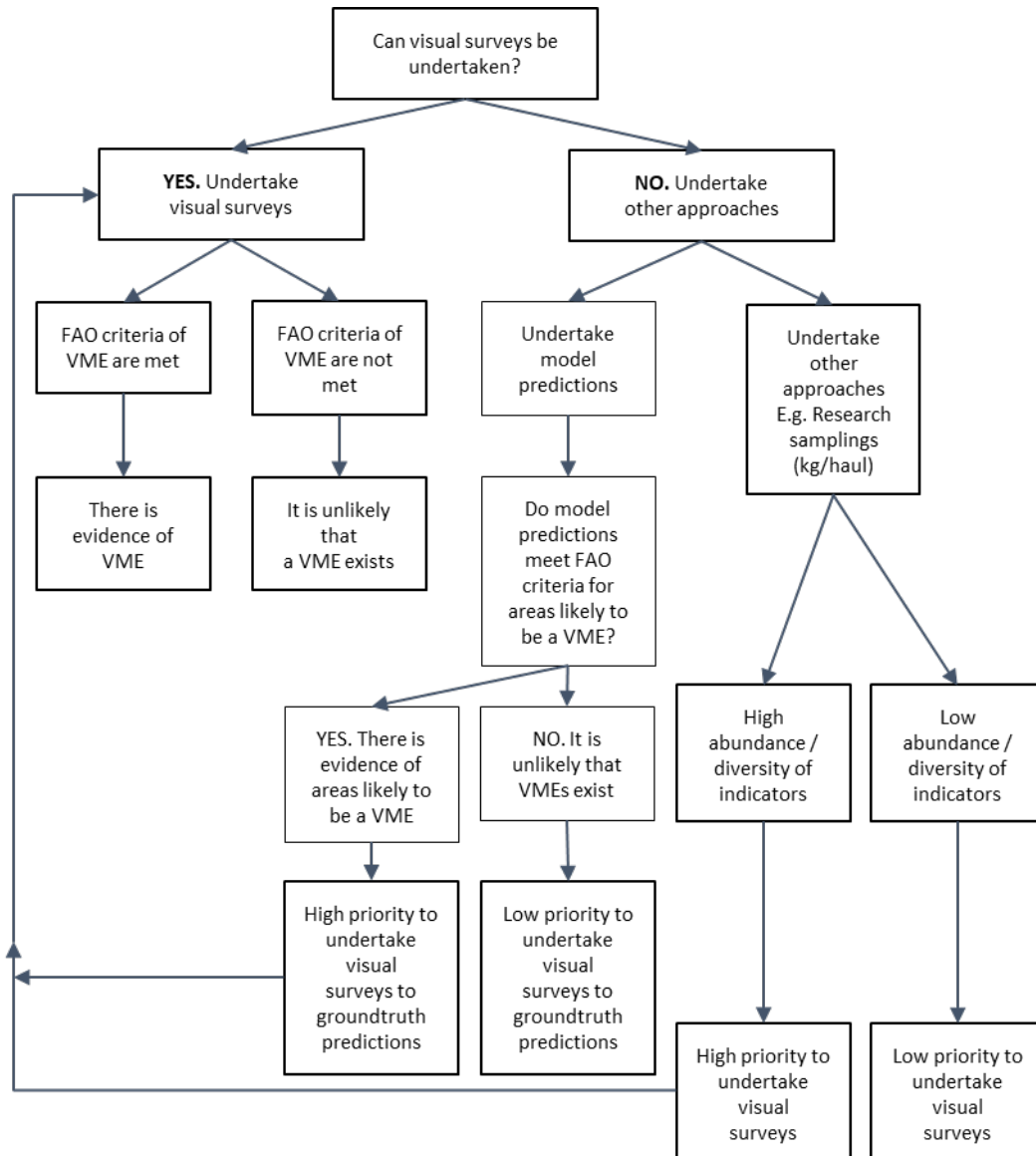
Annex 2.2

Template for reports on identification of VMEs and assessment of impacts caused by individual fishing activities on VMEs or marine species

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)
3. Status of the fishery (existing fishery or exploratory fishery)
4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)

- (1) Number of fishing vessels
 - (2) Tonnage of each fishing vessel
 - (3) Number of fishing days or days on the fishing ground
 - (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots per day for pot, total length of net per day for gillnet)
 - (5) Total catch by species
 - (6) Names of seamounts fished or to be fished
7. Fishing period
8. Analysis of status of fishery resources
- (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
9. Analysis of status of bycatch species resources
- (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
10. Analysis of existence of VMEs in the fishing ground
- (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species
12. Other points to be addressed
13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).

Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



**SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM
FISHING ACTIVITIES**

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch Data: Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- Length Frequency Data: Number of fish measured per species, by area and season.
- Biological Data: Type and quantity of other biological data or samples (otoliths, sex, maturity, etc.) collected per species.

Annex EE: CMM 2023-05 BF VME NWPO

- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Detection of Fishing in Association with Vulnerable Marine Ecosystems

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

E. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

F. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

NPFC BOTTOM FISHERIES OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
 - (a) NPFC vessel ID.
 - (b) Observer's name.
 - (c) Observer's organisation.
 - (d) Date observer embarked (UTC date).
 - (e) Port of embarkation.
 - (f) Date observer disembarked (UTC date).
 - (g) Port of disembarkation.

B. Catch & Effort Data to be collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - (a) Tow start date (UTC).
 - (b) Tow start time (UTC).
 - (c) Tow end date (UTC).
 - (d) Tow end time (UTC).
 - (e) Tow start position (Lat/Lon, 1 minute resolution).
 - (f) Tow end position (Lat/Lon, 1 minute resolution).
 - (g) Type of trawl, bottom or mid-water.
 - (h) Type of trawl, single, double or triple.
 - (i) Height of net opening (m).
 - (j) Width of net opening (m).
 - (k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
 - (l) Gear depth (of footrope) at start of fishing (m).
 - (m) Bottom (seabed) depth at start of fishing (m).
 - (n) Gear depth (of footrope) at end of fishing (m).
 - (o) Bottom (seabed) depth at end of fishing (m).

- (p) Status of the trawl operation (no damage, lightly damaged*, heavily damaged*, other (specify)).
*Degree may be evaluated by time for repairing (≤ 1 hr or > 1 hr).
- (q) Duration of estimated period of seabed contact (minute)
- (r) Intended target species.
- (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- (t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
 - (a) Set start date (UTC).
 - (b) Set start time (UTC).
 - (c) Set end date (UTC).
 - (d) Set end time (UTC).
 - (e) Set start position (Lat/Lon, 1 minute resolution).
 - (f) Set end position (Lat/Lon, 1 minute resolution).
 - (g) Net panel (“tan”) length (m).
 - (h) Net panel (“tan”) height (m).
 - (i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - (j) Bottom depth at start of setting (m).
 - (k) Bottom depth at end of setting (m).
 - (l) Number of net panels for the set.
 - (m) Number of net panels retrieved.
 - (n) Number of net panels actually observed during the haul.
 - (o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - (p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.
 - (q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.
 - (r) Intended target species.
 - (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).

- (t) Estimate of the amount (weight or volume) of all marine resources discarded* and dropped off, split by species. * Including those retained for scientific samples.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - (a) Set start date (UTC).
 - (b) Set start time (UTC).
 - (c) Set end date (UTC).
 - (d) Set end time (UTC).
 - (e) Set start position (Lat/Lon, 1 minute resolution).
 - (f) Set end position (Lat/Lon, 1 minute resolution).
 - (g) Total length of longline set (m).
 - (h) Number of hooks or traps for the set.
 - (i) Bottom (seabed) depth at start of set.
 - (j) Bottom (seabed) depth at end of set.
 - (k) Number of hooks or traps actually observed during the haul.
 - (l) Intended target species.
 - (m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - (n) An estimation of the amount (numbers or weight) of marine resources discarded* or dropped-off, split by species, during the actual observation. * Including those retained for scientific samples.
 - (o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

E. Length-Frequency Data to Be Collected

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).

2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological sampling to be conducted (optional for gillnet and long line fisheries)

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - (a) Species
 - (b) Length (to the nearest mm), with record of the type of length measurement used.
 - (c) Length and depth in case of North Pacific armorhead.
 - (d) Sex (male, female, indeterminate, not examined)
 - (e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.
5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be collected on Incidental Captures of Protected Species

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
 - (a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - (b) Count of the number caught per tow or set.
 - (c) Life status (vigorous, alive, lethargic, dead) upon release.
 - (d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - (a) Species (identified as far as possible or accompanied by a photograph where identification is difficult).
 - (b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the fishing operation.
 - (c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the fishing operation.
 - (d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

I. Data to be collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - (a) Observer name.
 - (b) Vessel name.
 - (c) Vessel call sign.
 - (d) Vessel flag.
 - (e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
 - (f) Species from which tag recovered.
 - (g) Tag colour and type (spaghetti, archival).
 - (h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
 - (i) Date and time of capture (UTC).
 - (j) Location of capture (Lat/Lon, to the nearest 1 minute)
 - (k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
 - (l) Sex (F=female, M=male, I=indeterminate, D=not examined)
 - (m) Whether the tags were found during a period of fishing that was being observed (Y/N)

(n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

1. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
2. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - (a) Fishing Operation Information
 - All vessel and tow / set / effort information.
 - (b) Monitoring of Catches
 - Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
 - Record numbers or proportions of each species retained or discarded.
 - (c) Biological Sampling
 - Length-frequency data for target species.
 - Length-frequency data for main by-catch species.
 - Identification and counts of protected species.
 - Basic biological data (sex, maturity) for target species.
 - Check for presence of tags.
 - Otoliths (and stomach samples, if being collected) for target species.
 - Basic biological data for by-catch species.
 - Biological samples of by-catch species (if being collected)
 - Photos
3. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsino)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2

Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be used for Recording Observer Data

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
 - (a) Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
 - (b) Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - (c) Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
 - (a) Kilograms are to be used to describe catch weight.
 - (b) Metres are to be used to describe height, width, depth, beam or length.
 - (c) Cubic metres are to be used to describe volume.
 - (d) Kilowatts are to be used to describe engine power.

**Implementation of the Adaptive Management for North Pacific armorhead
(in 2021)**

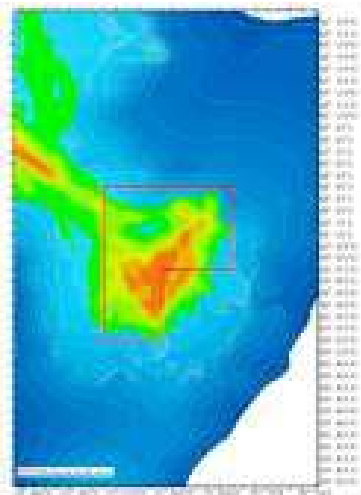
1. Monitoring survey for the detection of strong recruitment of North Pacific armorhead

(1) Location of monitoring surveys

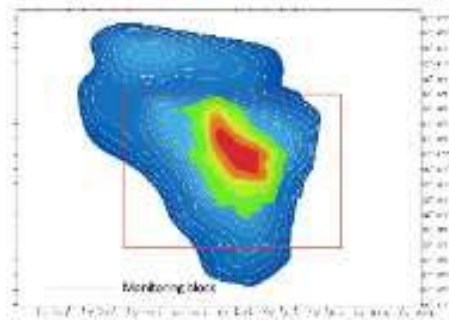
Monitoring surveys for the detection of strong recruitment of North Pacific armorhead will be conducted by trawl fishing vessels in the pre-determined four (24) monitoring blocks of Koko (South eastern), Yuryaku, Kammu (North western) and/or Colahan seamounts.

Monitoring blocks

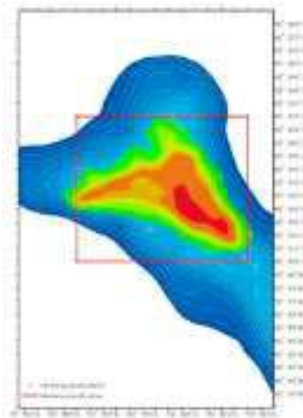
- (1) Koko seamount (34°51' –35°04'N, 171°49' –172°00' E)



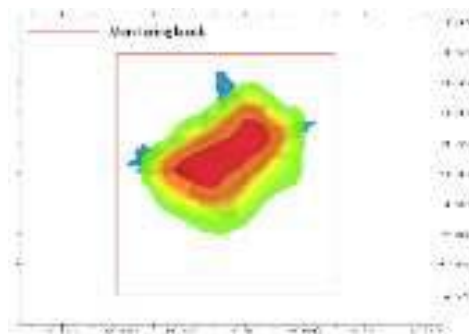
- (2) Yuryaku seamount (32°35' –32°45'N, 172°10' –172°24'E)



(3) Kammu seamount ($32^{\circ}10' - 32^{\circ}21'N$, $172^{\circ}44' - 172^{\circ}57'E$)



(4) Colahan seamount ($30^{\circ}57' - 31^{\circ}05'N$, $175^{\circ}50' - 175^{\circ}57'E$)



(2) Schedule for monitoring surveys

Monitoring surveys will be conducted from March 1st to June 30th each year, with at least a one week interval between monitoring surveys. For each survey, a trawl fishing vessel will conduct a monitoring survey in one of the four monitoring blocks that is the nearest from the location of the trawl fishing vessel at the time of prior notification in (4) below. The base schedule for monitoring surveys will be notified to the Executive Secretary by the end of February of each year. The base schedule may be revised during the year subject to prior notification to the Executive Secretary.

(3) Data to be collected during monitoring surveys

For each monitoring survey, a trawl net will be towed for one hour. A scientific observer onboard the trawl fishing vessel will calculate nominal-CPUE (kg/hour) of North Pacific armorhead. The scientific observer will also calculate fat index* (FI) of randomly sampled 100 individuals of North Pacific armorhead by measuring fork length (FL) and body height (BH) of each individual.

(*fat index (FI) = body height (BH) / fork length (FL))

(4) Prior notifications and survey results

At least three (3) days before each survey, a prior notification with monitoring date/time, location and trawl fishing vessel name will be provided by the flag state of the trawl fishing vessel to the Executive Secretary.

No later than three (3) days after each survey, the survey result including date/time, location, catch, nominal-CPUE (kg/hour) and percentage of fish with fat index (FI)>0.3 will be provided by the flag state to the Executive Secretary.

The Executive Secretary will circulate these prior notifications and survey results to all Members of the Commission without delay.

1. Areas where bottom fishing with trawl gear is prohibited when high recruitment is detected

(1) Criteria for a high recruitment

It is considered that high recruitment has occurred if the following criteria are met in four (4) consecutive monitoring surveys.

- Nominal CPUE > 10t/h
- Individuals of fat index (FI)> 0.3 account for 80% or more

(2) Areas where bottom fishing with trawl gear is prohibited

Bottom fishing with trawl gear shall be prohibited in the following two (2) seamount areas (*) during the year when high recruitment is detected. In such a case, all monitoring surveys scheduled during the year will be cancelled.

- Northern part of Kammu seamount (north of 32°10.0' N)
- Yuryaku seamount

(*) The catch of North Pacific armorhead in the above two seamounts accounts for a half of the total catch in the entire Emperor Seamounts area based on the catch records in 2010 and 2012.

(3) Notification by the Secretariat

When the criteria for high recruitment are met as defined in 2(1) above, the Executive Secretary will notify all Members of the Commission of the fact with a defined date/time from which bottom fishing with trawl gear is prohibited in the areas as defined in 2(2) above until the end of the year.

CMM 2023-06

(Entered into force xx xx 2023)

**CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE
ECOSYSTEMS IN THE NORTHEASTERN PACIFIC OCEAN**

The North Pacific Fisheries Commission (NPFC):

Seeking to ensure the long term conservation and sustainable use of the fishery resources of the Northeastern Pacific Ocean and, in so doing, protect the vulnerable marine ecosystems that occur there, in accordance with the Sustainable Fisheries Resolutions adopted by the United Nations General Assembly (UNGA) including, in particular, paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, paragraphs 69 and 80 to 91 of UNGA61/105 in 2006, and paragraphs 113 to 124 of UNGA64/72 in 2009;

Recalling that paragraph 85 of UNGA 61/105 calls upon participants in negotiations to establish regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to adopt permanent measures in respect of the area of application of the instruments under negotiation;

Noting that North Pacific Fisheries Commission has previously adopted interim measures for the Northeastern Pacific Ocean;

Conscious of the need to adopt permanent measures for the Northeastern Pacific Ocean to ensure that this area is not left as the only major area of the Pacific Ocean where no such measures are in place;

Hereby adopt the following Conservation and Management Measure (CMM) for bottom fisheries of the Northeastern Pacific Ocean while working to develop and implement other permanent management arrangements to govern these and other fisheries in the North Pacific Ocean.

Scope

1. These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northeastern Pacific Ocean, defined, for the purposes of this document, as those occurring in the Convention Area as set out in Article 4 of the Convention text to the east of the

line of 175 degrees W longitude (here in after called “the eastern part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

For the purpose of these Measures, the term vulnerable marine ecosystems is to be interpreted and applied in a manner consistent with the International Guidelines on the Management of Deep Sea Fisheries on the High Seas adopted by the FAO on 29 August 2008 (see Annex 2 for further details).

2. The implementation of these Measures shall:

- a. be based on the best scientific information available in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
- b. establish appropriate and effective conservation and management measures,
- c. be in accordance with the precautionary approach, and
- d. incorporate an ecosystem approach to fisheries management.

3. Actions by Members of the Commission

Members of the Commission will take the following actions in respect of vessels operating under its Flag or authority in the area covered by these Measures:

- a. Conduct the assessments called for in paragraph 83(a) of UNGA Resolution 61/105, in a manner consistent with the FAO Guidelines and the Standards and Criteria included in Annex 2;
- b. Submit to the SC their assessments conducted pursuant to subparagraph (a) of this paragraph, including all relevant data and information in support of any such assessment, and receive advice and recommendations from the SC, in accordance with the procedures in Annex 3;
- c. Taking into account all advice and recommendations received from the SC, determine whether the fishing activity or operations of the vessel in question are likely to have a significant adverse impact on any vulnerable marine ecosystem;
- d. If it is determined that the fishing activity or operations of the vessel or vessels in question would have a significant adverse impact on vulnerable marine ecosystems, adopt conservation and management measures to prevent such impacts on the basis of advice and recommendations of the SC, which are subject to adoption by the Commission;
- e. Ensure that if any vessels are already engaged in bottom fishing, that such assessments have been carried out in accordance with paragraph 119(a)/UNGA RES 2009, the determination called for in subparagraph (c) of this paragraph has been rendered and, where appropriate,

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- managements measures have been implemented in accordance with the advice and recommendations of the SC, which are subject to adoption by the Commission;
- f. Further ensure that they will only authorize fishing activities on the basis of such assessments and any comments and recommendations from the SC;
 - g. Prohibit its vessels from engaging in directed fishing on the following orders: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, the classes of *Hexactinellida* and *Demospongiae* in the phylum Porifera as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the Commission;
 - h. In respect of areas where vulnerable marine ecosystems are known to occur or are likely to occur, based on the best available scientific information, ensure that bottom fishing activities do not proceed unless conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems;
 - i. Limit fishing effort in bottom fisheries on the Eastern part of the Convention Area to the level of a historical average (baseline to be determined through consensus in the SC based on information to be provided by Members) in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems dependent on new SC advice;
 - j. Further, considering accumulated information regarding fishing activities in the Eastern part of the Convention Area, in areas where, in the course of fishing operations, cold water corals that exceed 50Kg or 500Kg of *Hexactinellida* and *Demospongiae* are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 1 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species, shall be reported to the Secretariat, through the Member, within one business day. The Executive Secretary shall notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets.. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the VME indicator taxa include cold water corals *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*, and the classes of *Hexactinellida* and *Demospongiae* in the phylum Porifera.
 - k. Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If

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so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.

4. All assessments and determinations by any Member as to whether fishing activity would have significant adverse impacts on vulnerable marine ecosystems, as well as measures adopted in order to prevent such impacts, will be made publicly available through agreed means.

Control of Bottom Fishing Vessels

5. Members will exercise full and effective control over each of their bottom fishing vessels operating in the high seas of the Northeastern Pacific Ocean, including by means of fishing licenses, authorizations or permits, and maintenance of a record of these vessels as outlined in the Convention and applicable CMM.
6. New and exploratory fishing will be subject to the exploratory fishery protocol included as Annex 1.

Scientific Committee (SC)

7. Scientific Committee will provide scientific support for the implementation of these CMMs.

Scientific Information

8. The Members shall provide all available information as required by the Commission for any current or historical fishing activity by their flag vessels, including the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, areas fished (names or coordinates of seamounts), and information from scientific observer programmes (see Annexes 4 and 5) to the NPFC Secretariat as soon as possible and no later than one month prior to SC meeting. The Secretariat will make such information available to SC.
9. Scientific research activities for stock assessment purposes are to be conducted in accordance with a research plan that has been provided to SC prior to the commencement of such activities.

EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.

2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:

- i. precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
- ii. precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
- iii. regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
- iv. measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
- v. comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.

3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:

(1) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.

(2) The assessment in (1) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.

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(3) The SC is to review the information and the assessment submitted in (1) above in accordance with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”

(4) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the basis of comments and recommendations of SC. Any determinations, by any Member of the Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.

5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.

6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.

7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.

8. The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4(1)(a).

Appendix 1.1

Information to be provided before exploratory fisheries start

1. A harvesting plan

- Name of vessel
- Flag member of vessel
- Description of area to be fished (location and depth)
- Fishing dates
- Anticipated effort
- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

2. A mitigation plan

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

3. A catch monitoring plan

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

4. A data collection plan

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

Appendix 1.2

Information to be included in the report

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES

1. Introduction

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

2. Purpose

(1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities¹ on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the Commission.

¹ “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.

(2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as follows:

- (a) The fisheries are conducted in the Convention Area;
- (b) The total catch (everything brought up by the fishing gear) includes species that can only sustain low exploitation rates; and
- (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations

3. Definition of VMEs

(1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.

(2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover, or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).

(3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.

- (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
 - (i) Habitats that contain endemic species;
 - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
 - (iii) Nurseries or discrete feeding, breeding, or spawning areas
- (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or

endangered marine species.

(c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities

(d) Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:

- (i) Slow growth rates
- (ii) Late age of maturity
- (iii) Low or unpredictable recruitment
- (iv) Long-lived

(e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

(4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. For example, whether the ecological unit is a group of seamounts, or an individual seamount in the Convention Area, is to be decided using the above criteria.

4. Identification of potential VMEs

(1) Fished seamounts

(a) Identification of fished seamounts

It is reported that two types of fishing gear are currently used by members of the Commission in the NE area, namely long-line hook and long-line trap. The footprint of the bottom fisheries (fished seamounts) is identified based on the available fishing record. The following seamounts have been identified as fished seamounts at some point in the past: Brown Bear, Cobb, Warwick, Eickelberg, Pathfinder, Miller, Murray, Cowie, Surveyor, Pratt, and Durgin. It is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may be physically unsuitable for certain fishing gears. Thus, it is important to know actual fished areas within the same seamount so as to know the gravity of the impact of fishing

activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

5. Assessment of SAIs on VMEs or marine species

(1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.

(2) When determining the scale and significance of an impact, the following six factors are to be considered:

- (a) The intensity or severity of the impact at the specific site being affected;
- (b) The spatial extent of the impact relative to the availability of the habitat type affected;
- (c) The sensitivity/vulnerability of the ecosystem to the impact;
- (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;
- (e) The extent to which ecosystem functions may be altered by the impact; and
- (f) The timing and duration of the impact relative to the period in which a species needs

the habitat during one or more life-history stages.

(3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

(4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.

(5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:

- (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
- (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
- (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment
- (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
- (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
- (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.

(6) Impact assessments are to consider, as appropriate, the information referred to in these Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.

(7) Where an assessment concludes that the area does not contain VMEs or that significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

ANNEX 2.1

EXAMPLES OF POTENTIAL VULNERABLE SPECIES GROUPS, COMMUNITIES AND HABITATS AS WELL AS FEATURES THAT POTENTIALLY SUPPORT THEM

The following examples of species groups, communities, habitats and features often display

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characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which may contribute to forming VMEs:	
a.	certain coldwater corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), black corals (antipatharia), and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyphores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and
d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities, referred to above:	
a.	submerged edges and slopes (e.g., corals and sponges),
b.	summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges, xenophyphores),
c.	canyons and trenches (e.g., burrowed clay outcrops, corals),
d.	hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
e.	cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

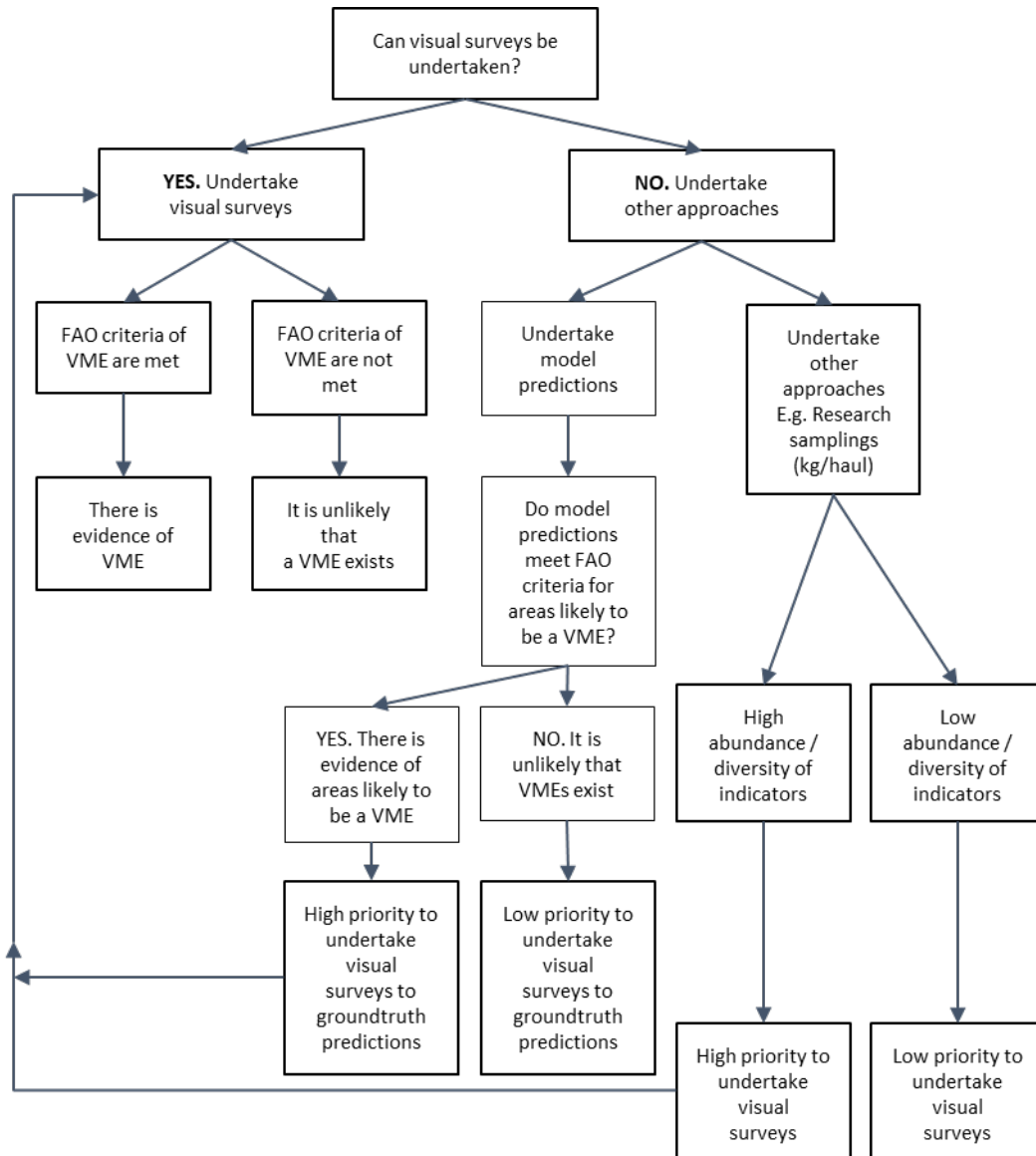
ANNEX 2.2

TEMPLATE FOR REPORTS ON IDENTIFICATION OF VMEs AND ASSESSMENT OF IMPACTS CAUSED BY INDIVIDUAL FISHING ACTIVITIES ON VMEs OR MARINE SPECIES

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)

3. Status of the fishery (existing fishery or exploratory fishery)
4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)
 - (1) Number of fishing vessels
 - (2) Tonnage of each fishing vessel
 - (3) Number of fishing days or days on the fishing ground
 - (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots per day for pot, total length of net per day for gillnet)
 - (5) Total catch by species
 - (6) Names of seamounts fished or to be fished
7. Fishing period
8. Analysis of status of fishery resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
9. Analysis of status of bycatch species resources
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
10. Analysis of existence of VMEs in the fishing ground
 - (1) Data and methods used for analysis
 - (2) Results of analysis
 - (3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties
11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species
12. Other points to be addressed
13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).

Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM FISHING ACTIVITIES

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons

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- **Catch Data:** Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- **Length Frequency Data:** Number of fish measured per species, by area and season.
- **Biological Data:** Type and quantity of other biological data or samples (otoliths, sex, maturity, etc) collected per species.
- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Detection of Fishing in Association with Vulnerable Marine Ecosystems

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

E. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

F. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

**NPFC BOTTOM FISHERIES
OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT**

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
 - a) NPFC vessel ID
 - b) Observer's name.
 - c) Observer's organisation.
 - d) Date observer embarked (UTC date).
 - e) Port of embarkation.
 - f) Date observer disembarked (UTC date).
 - g) Port of disembarkation.

B. Catch & Effort Data to be collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - a) Tow start date (UTC).
 - b) Tow start time (UTC).
 - c) Tow end date (UTC).
 - d) Tow end time (UTC).
 - e) Tow start position (Lat/Lon, 1 minute resolution).
 - f) Tow end position (Lat/Lon, 1 minute resolution).
 - g) Type of trawl, bottom or mid-water.
 - h) Type of trawl, single, double or triple.
 - i) Height of net opening (m).
 - j) Width of net opening (m).
 - k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
 - l) Gear depth (of footrope) at start of fishing (m).

- m) Bottom (seabed) depth at start of fishing (m).
- n) Gear depth (of footrope) at end of fishing (m).
- o) Bottom (seabed) depth at end of fishing (m).
- p) Status of the trawl operation (no damage, lightly damaged*, heavily damaged*, other (specify)). *Degree may be evaluated by time for repairing (≤ 1 hr or > 1 hr)
- q) Duration of estimated period of seabed contact (minute)
- r) Intended target species.
- s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
 - a) Set start date (UTC).
 - b) Set start time (UTC).
 - c) Set end date (UTC).
 - d) Set end time (UTC).
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).
 - g) Net panel (“tan”) length (m).
 - h) Net panel (“tan”) height (m).
 - i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - j) Bottom depth at start of setting (m).
 - k) Bottom depth at end of setting (m).
 - l) Number of net panels for the set.
 - m) Number of net panels retrieved.
 - n) Number of net panels actually observed during the haul.
 - o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.

- q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.
- r) Intended target species.
- s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- t) Estimate of the amount (weight or volume) of all marine resources discarded* and dropped-off, split by species. * Including those retained for scientific samples.
- u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - a) Set start date (UTC).
 - b) Set start time (UTC).
 - c) Set end date (UTC).
 - d) Set end time (UTC).
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).
 - g) Total length of longline set (m).
 - h) Number of hooks or traps for the set.
 - i) Bottom (seabed) depth at start of set.
 - j) Bottom (seabed) depth at end of set.
 - k) Number of hooks or traps actually observed during the haul.
 - l) Intended target species.
 - m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
 - n) An estimation of the amount (numbers or weight) of marine resources discarded* or dropped-off, split by species, during the actual observation. * Including those retained for scientific samples.
 - o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

E. Length-Frequency Data to Be Collected

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1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).
2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological sampling to be conducted (optional for gillnet and long line fisheries)

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - a) Species
 - b) Length (to the nearest mm), with record of the type of length measurement used.
 - c) Length and depth in case of North Pacific armorhead.
 - d) Sex (male, female, indeterminate, not examined)
 - e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.

5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be collected on Incidental Captures of Protected Species

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
 - a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - b) Count of the number caught per tow or set.
 - c) Life status (vigorous, alive, lethargic, dead) upon release.
 - d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - a) Species (identified as far as possible, or accompanied by a photograph where identification is difficult).
 - b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the fishing operation.
 - c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the fishing operation.
 - d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

I. Data to be collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - a) Observer name.
 - b) Vessel name.
 - c) Vessel call sign.
 - d) Vessel flag.
 - e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
 - f) Species from which tag recovered.
 - g) Tag colour and type (spaghetti, archival).
 - h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
 - i) Date and time of capture (UTC).
 - j) Location of capture (Lat/Lon, to the nearest 1 minute)
 - k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
 - l) Sex (F=female, M=male, I=indeterminate, D=not examined)
 - m) Whether the tags were found during a period of fishing that was being observed (Y/N)
 - n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

1. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
2. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - a) Fishing Operation Information
 - All vessel and tow / set / effort information.

b) Monitoring of Catches

- Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
- Record numbers or proportions of each species retained or discarded.

c) Biological Sampling

- Length-frequency data for target species.
- Length-frequency data for main by-catch species.
- Identification and counts of protected species.
- Basic biological data (sex, maturity) for target species.
- Check for presence of tags.
- Otoliths (and stomach samples, if being collected) for target species.
- Basic biological data for by-catch species.
- Biological samples of by-catch species (if being collected)
- Photos

3. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsino)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be used for Recording Observer Data

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1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
 - a. Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
 - b. Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - c. Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
 - a. Kilograms are to be used to describe catch weight.
 - b. Metres are to be used to describe height, width, depth, beam or length.
 - c. Cubic metres are to be used to describe volume.
 - d. Kilowatts are to be used to describe engine power.

NPFC DATA SHARING AND DATA SECURITY PROTOCOL

SECTION 1 – INTERPRETATION

- 1.** This Protocol shall be interpreted, unless specifically defined herein, in accordance with the Convention and any Conservation and Management Measures (CMMs) adopted by the Commission.

- 2.** The following definitions apply:
 - a)** “data” includes both raw and processed information, including but not limited to electronic data files (regardless of their storage media and including hard copies, like discs or thumb drives, and data otherwise in transit), and information derived from processed data (regardless of the storage or presentation media). Data also includes technical reports, system documentation, user manuals, contracts, guidelines, and/or procedures;

 - b)** “confidential data” refers to nonpublic domain data and information held by Members, the Secretariat, and by service providers contracted by the Commission, or contractors acting on their behalf, that is to be kept private, and shall not be accessed, released, or disclosed unless such access, release, or disclosure is for the purposes described in, and authorized by, this Protocol;

 - c)** “public domain data” is data that is not confidential, including that which is already in the public domain through publication in electronic or print format. Public domain data excludes private information about individuals or information which can identify activities of any individuals, vessels, or companies.

 - d)** “internal users” are defined as the Officers of the Commission, Commission committees and their subsidiary bodies, Members, Cooperating Non-Contracting Parties (CNCs), the Secretariat, as well as authorized contractors, consultants, and/or service providers;

 - e)** “external users” are defined as persons or organizations other than internal users, such as the public, non-governmental organizations (NGOs), academic and/or

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research institutes, media, and other RFMOs with or without a Memorandum of Understanding (MOU) with the Commission; and

- f) “scientific purposes” may include estimating distribution of fishing effort for use in the Commission’s research activities, planning for and implementing tagging programmes, modelling fishing effort for use in fisheries management activities, including management strategy evaluation, estimating abundance indices or undertaking stock assessments, validating logbook data, and any other scientific purposes agreed to by the Commission.

SECTION 2 – PURPOSE

- 3. This Protocol, in accordance with Article 16 (4) of the Convention, establishes rules to ensure the security of, access to, and dissemination of data while maintaining confidentiality where appropriate and taking due account of the domestic law and practices of Members.

SECTION 3 – APPLICATION

- 4. This Protocol applies to all data collected by the Commission.

SECTION 4 – GENERAL PRINCIPLES

- 5. The Executive Secretary is responsible for the management of NPFC data received and held by the Secretariat in accordance with this Protocol.
- 6. The data owner, such as the Executive Secretary for the Secretariat, the Representative for the Member, or the author of a document not yet in the public domain, will be responsible for identifying confidential data along with any confidentiality requirements for their security, unless confidentiality is already made clear under this Protocol.
- 7. It is a priority of the Commission to protect Members’ and the Commission’s data, and to inform Members of their responsibility to protect, use, and disclose this data in an authorized manner.

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- 8.** The Commission will endeavor to make information relating to its Data Sharing and Data Security Protocols and procedures readily available to individuals, Members, CNCs, or other parties.

SECTION 5 – DATA USE

Public Domain Data

- 9.** There are no limitations on the use of public domain data. NPFC’s public domain data may be accessed on its website and/or upon request.
- 10.** Data released by the Secretariat to the public domain shall not reveal the individual activities of any vessel, company, or person, shall not disclose personal or business identities, and shall not contain confidential data, unless decided otherwise by the Commission. In this regard, catch and effort data in the public domain shall be made up of observations from a minimum of three vessels, unless the owner of the data decides otherwise.
- 11.** Besides the data described in Paragraphs 8 and 9, examples of data listed in *Appendix 1* are considered to be public domain data.
- 12.** The NPFC website should contain a statement describing the conditions associated with the viewing or downloading of public domain data (for example, that the source of the data must be acknowledged) and should require the person requesting the data to “accept” these conditions before viewing / downloading can begin.
- 13.** The Secretariat is responsible for media releases in accordance with the decisions of the Commission.

Non-Public Domain Data

- 14.** Subject to the decisions of the Commission, all types of data not described in Paragraph 10 shall be referred to as non-public domain data and considered to be confidential.
- 15.** A list of examples of non-public domain data can be found in *Appendix 2*.

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16. Access to and dissemination of non-public domain data shall be authorized in accordance with this Protocol.

17. The Secretariat shall log and report to the Commission all access by and dissemination to an external user of non-public domain data, including the name and affiliation of the person, the type of data accessed or disseminated, the purpose for which the data were requested, the date when the data were requested, the date when the data were released, and authorizations that may have been required.

18. The use of non-public data may occur under the following circumstances, unless otherwise specified in any CMMs and this Protocol.
 - a) Persons duly authorized by the Executive Secretary, including Secretariat staff, contractors, consultants, and service providers, shall have access to the data necessary to perform their NPFC duties. Officers of the Commission, Commission subcommittees, and their subsidiary bodies shall have access to the data necessary to perform their NPFC duties.
 - i. Secretariat staff, as part of their NPFC duties, are expected to keep non-public domain data confidential, are expected to be familiar with the procedures to protect confidential data, and are expected to understand that they will maintain the data security standards of the Commission. Such security responsibilities will be described to staff members when they start the position and are included in the terms and conditions of their employment.
 - ii. Any persons listed in (a), other than Secretariat staff, granted access to non-public domain data shall sign a Confidentiality Agreement (*Appendix 3*) with the Secretariat confirming that they have been informed that the data is confidential, that they have reviewed, and are familiar, with the procedures to protect confidential data, and that they will maintain the data security standards of the Commission in respect of data to which they have access. The Secretariat is to maintain a Register of all such persons (including the purpose for which they require access to the data) and make the Register available to Members upon written request.

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b) Access to non-public domain data by Members and CNCPs

- i.** Members and CNCPs shall have access to non-public domain data to serve the purposes of the Convention, including data:
 - covering vessels flying their flag in the Convention Area
 - covering any vessels fishing in waters under their jurisdiction
 - covering vessels unloading in their ports or transshipping fisheries resources within waters under their jurisdiction
- ii.** Members and CNCPs shall notify the Secretariat of a small number of representatives (preferably limited to two) authorized to receive non-public domain data. Such notification will include name, affiliation, and contact information (e.g., telephone and email address). The Secretariat will maintain a list of such authorized representatives. Members and the Secretariat shall ensure the list of Members' representatives is kept up to date and made available.
- iii.** The authorized representative(s) of Members and CNCPs are responsible for ensuring the confidentiality and security of the non-public domain data in a manner consistent with security standards established by the Commission.
- iv.** The non-public domain data described in 18(b)(i). above will be made available by the Secretariat to authorized representatives of the Members and CNCPs upon request and, where appropriate, available to download by secure means from the Commission's website.
- v.** Access to non-public domain data by Members and CNCPs shall be administered by the Executive Secretary on the basis of this protocol.

c) Exchange of data with other RFMO/As:

- i.** if the Commission enters into arrangements for the exchange of data with other RFMO/As, such arrangements may require the NPFC and the other RFMO/A to provide equivalent data on a reciprocal basis and maintain the

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data provided in a manner consistent with the security standards established by the Commission; and

- ii. at each annual meeting of the Commission, the Secretariat is to provide copies of data exchange arrangements that exist with other RFMO/As and a summary of the data exchanges that occurred during the previous twelve months under such arrangements.

d) Dissemination of non-public domain data in other circumstances

- i. Non-public domain data will be made available by the Secretariat to any persons if the data owner authorizes the Commission to release them. In cases where a Member elects to provide an ongoing authorization for the release of such data, the Member may at any time cancel this authorization by notifying the Secretariat that it has revised its earlier decision. Unless otherwise requested by the provider of the data:
 - Persons that request non-public domain data shall complete and sign the Data Request Form and sign the Confidentiality Agreement (*Appendix 3*) and provide them to the Commission in advance of obtaining access to said data.
 - The completed and signed Data Request Form and Confidentiality Agreement shall then be forwarded to the Member that originally provided the requested data and the provider shall be requested to authorize the Commission to release the data. The Secretariat is to maintain a Register of all such persons (including the purpose for which they require access to the data) and make the Register available to Members upon written request.
 - Such persons that request non-public domain data shall also agree to maintain the data requested in a manner consistent with the Section 7 on security standards, as established by the Commission.

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- ii. Members and CNCPs that have provided non-public domain data to the Commission shall notify the Secretariat of their representatives with the authority to authorize the release of non-public domain data by the Commission. Decisions whether to authorize the release of such data shall be made in a timely manner.

SECTION 6 – DATA COLLECTION AND MANAGEMENT FOR SPECIFIC PURPOSES

Scientific Data

19. Data collected or used for scientific purposes shall be collected, stored, accessed, used, and disseminated in accordance with the *Regulations for Management of Scientific Data and Information* developed by the Scientific Committee and approved by the Commission.

Monitoring, Control, Surveillance, and Enforcement Data

General Principles

20. Each Member's Representative, and the Executive Secretary, is responsible for the monitoring, control, surveillance, and enforcement data under its control. Member Representatives and/or the Executive Secretary may designate, in writing, others who are permitted to access this data and who would not otherwise be permitted to do so under this Protocol or the Convention through a Confidentiality Agreement, making such users accountable for compliance with this Protocol.
21. Where monitoring, control, surveillance, and enforcement data are provided to a third party, the individual providing the data shall remain responsible for such data. Monitoring, control, surveillance, and enforcement data shall only be provided to third parties with security safeguards equal to or greater than those enumerated in Section 7 of this Protocol.
22. Any monitoring, control, surveillance, and enforcement data received by the Commission from a third party, such as an RFMO, shall be considered Commission data or information, and therefore be protected in a manner consistent with this Protocol.

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- 23.** All monitoring, control, surveillance, and enforcement data shall be considered confidential data and shall be protected in a manner appropriate to their sensitivity. In establishing appropriate safeguards, attention should be given to ensuring reasonable availability and utility of monitoring, control, surveillance, and enforcement data in order to fulfill the functions of the Commission, while more sensitive information should be safeguarded by a higher level of protection.
- 24.** All monitoring, control, surveillance, and enforcement data collected and managed by the Commission, including the Secretariat, under any CMM will be protected and accessed in accordance with the principles in this protocol, unless otherwise stated in a specific CMM. Further considerations for specific data types are outlined below.

Vessel Monitoring System

- 25.** Vessel monitoring system data shall be collected, stored, accessed, used, and disseminated in accordance with the NPFC Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) Data.

High Seas Boarding and Inspection Reports and Violation Case Package

- 26.** Boarding reports and violation information shall be treated as confidential data, subject to any domestic legal disclosure requirements, and shared in accordance with the HSBI CMM as established by the Commission.
- 27.** Data related to boarding and inspection operations, including potential violations, may be disseminated, in accordance with this protocol, to other authorized inspection vessels and inspectors as necessary for carrying out monitoring, control, surveillance, and enforcement responsibilities in the Convention Area, unless such data is being used in an investigation, judicial, or administrative proceeding, and subject to consent by the inspecting Member and any relevant domestic laws and policies.
- 28.** Members may request data covered in this Protocol for fishing vessels under the Member's jurisdiction, as well as vessels applying to conduct fishing activities in the Member's national waters, unload in the Member's ports, or transship within waters under the Member's jurisdiction, for the purposes of monitoring, control, surveillance and enforcement.

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- 29.** Boarding and inspection reports and violation case data must be collected, stored, and reported in a standardized format. They must comply with the time requirements specified by the Commission, as well with as the HSBI CMM content requirements.
- 30.** Security safeguards established by the authorized inspector and authorized inspection vessel for boarding and inspection reports and violation case data must include measures to ensure the integrity and authenticity of such data, and particularly during transmission of the boarding and inspection reports and violation case data between authorized inspectors and other authorized recipients.

Vessel License and Registration

- 31.** All vessel register data, including those pertaining to fishing vessels authorized for fishing activities in the Convention Area, and authorized inspection vessels and authorities or inspectors, will be securely maintained, and made available in accordance with relevant CMMs as established by the Commission.
- 32.** Under the CMM on Vessel Registration, Members and CNCs shall ensure they have maintained the NPFC Vessel Registry and shall make the record publicly available as appropriate and subject to any legal confidentiality regulations of the individual Member and CNC. The Commission shall provide to any Member or CNCs, upon request, information about any vessel entered on the Commission record that is not otherwise publicly available, per *Appendix 2*.
- 33.** All additions, modifications, or removal of data or information from vessel registers must be logged.

Illegal, Unreported, and Unregulated Fishing Vessel Data and Information

- 34.** Illegal, unreported, and unregulated vessel and fishing data will be made available for external users only in accordance with the CMM To Establish a List of Vessels Presumed to Have Carried Out IUU Activities in the Convention Area.

SECTION 7 – DATA SECURITY

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Confidential Data Transmission

- 35.** Confidential data must be transmitted using secure transmission methods.
- 36.** Each Member, CNCP and the Executive Secretary shall ensure the security of data in their respective electronic data processing facilities, particularly where the use of data involves transmission over a network. Security measures must be appropriate to the level of sensitivity posed by the transmission, processing, and storage of the confidential data.

Data Access and Storage

- 37.** The Executive Secretary shall implement, at a minimum, the following measures to ensure that access to data under the control of the Secretariat is protected such that all data that enters the system is securely stored and will not be accessed by or tampered with from unauthorized individuals:
 - a. physical access to the computer system which transmits, uses, and stores data is controlled;
 - b. each user of the system is assigned a unique identification and associated password, and each time the user logs on to the system, he or she must provide the correct password;
 - c. user access shall be audited annually for analysis and detection of security breaches; and
 - d. each user shall be given access only to the data necessary for his or her task.
- 38.** Hard copies of data will be stored in a secure area within the offices of the Secretariat and will physically be protected from unauthorized access, damage, and/or interference.

Data Warehousing and Lifecycle

- 39.** Data collected by or transmitted to the Secretariat under the Convention or CMM requirements (i.e. data in annual reports, VMS) will be held in perpetuity.
- 40.** Data maintained by the Secretariat will be annually backed-up to a secure server and all back-up copies of data will be tracked.

Asset Management

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- 41.** The Executive Secretary, for the Secretariat, is the primary owner of Commission data, unless otherwise specified. As the owner of Commission data, the Executive Secretary remains responsible for the protection of data, to periodically review the maintenance of the data, and to ensure that it is being kept in accordance with this protocol.

Reporting of Security Incidents

- 42.** All users of NPFC data are required to report any information on security breaches, possible breaches, weaknesses, or other issues as quickly as possible to the Secretariat.

Examples of Public Domain Data

- a)** The data described in Article 16(2) of the Convention;
- b)** annual catch estimates stratified by gear, flag, and species, and number of fishing days;
- c)** catch and effort data aggregated by gear type, flag, year/month, and 5° latitude and 5° longitude, where applicable – and made up of observations from a minimum of three vessels;
- d)** biological data (if adequate time has passed to allow the scientists that organised for the collection of such data to publish a paper analysing it);
- e)** the NPFC Vessel Registry;
- f)** information on vessel and gear attributes compiled from other sources;
- g)** oceanographic and meteorological data;
- h)** Section 1 of the Annual Report to the Commission by Members.
- i)** IUU vessel list;
- j)** for purposes of HSBI transparency, name of inspection vessel, and flag state of vessel boarded in accordance with HSBI CMM procedures;
- k)** final Compliance Report and Executive Summary; and
- l)** any other types of data that the Commission decides to make publicly available.

Examples of Non-Public Domain Data

- a)** operational level catch and effort data;
- b)** operational level landing data;
- c)** operational level transshipment data;
- d)** data describing (at a fine resolution) the movement of vessels, including near real time vessel position, direction and speed (this includes Commission VMS data);
- e)** boarding and inspection reports;
- f)** observer reports;
- g)** certified inspection personnel;
- h)** port state inspection reports;
- i)** violations and infringements, detailed;
- j)** Section 2 and 3 of the Annual Report to the Commission by Members;
- k)** data that reveals the individual activities of any vessel, company, or person;
- l)** draft and provisional compliance reports and all associated documentation;
- m)** any other data classified as non-public domain data in accordance with the domestic requirements of Members; and
- n)** any other types of data that the Commission decides not to make publicly available.

Data Request Form and Confidentiality Agreement:
for individuals seeking access to non-public data held by the Secretariat

Please include the name(s), contact information, and signature(s) of the authorized representative(s) (attaching an additional sheet if necessary) for whom access to the data is being requested; the use of the non-public domain data shall be authorised only for the person(s) listed below]

Full Name	Agency/Organization, Address, Email, & Phone	Signature and Date

In return for the NPFC Secretariat granting me access to non-public NPFC data, I hereby make the following declarations and promises:

1. I am requesting access to NPFC data:
 - a. for the following purposes (provide a detailed explanation, attaching an additional sheet if necessary):

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2. I have read, understood, and will abide by the NPFC Data Sharing and Data Security Protocol (“Protocol”). I understand that the data I am requesting are confidential, as defined in the Protocol. I agree to abide by the provisions of the Protocol that address protecting and safeguarding this data.
3. I agree to abide by any additional written conditions regarding the use of this data that the Secretariat attaches to this Confidentiality Agreement.
4. I agree that this data shall be used only for the purposes for which I have requested, accessed only by me and other individuals who have signed a Confidentiality Agreement, and will be destroyed within seven days upon completion of the usage for which the data are being requested. I further agree to report the destruction of data to the Secretariat.
5. I agree to make no unauthorized copies of this data. If a copy of all, or part, of the data is made by me, all copies, and/or parts thereof, will be registered with the Secretariat and will be destroyed within seven days upon completion of the purpose for which I requested the data
6. Prior to the publication of any report in which I intend to use requested this data, I agree to provide the report to the Secretariat for clearance to ensure that no data will be published.
7. I agree to provide a copy of any published reports referenced in paragraph 6 to the Secretariat.
8. I agree not to disclose, divulge, or transfer, either directly or indirectly, the requested data to any third party without the prior written consent of the Secretariat.
9. I agree to promptly notify the Secretariat, in writing, of any unauthorized or inadvertent disclosure of this data.
10. I assume all liability, if any, with respect to my breach of this Confidentiality Agreement after I receive the requested data.
11. In the event of my breach of this Confidentiality Agreement, I understand that the Secretariat will not grant me access to data until corrective actions deemed appropriate by

Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation (MOC)

Abstract: COM07 reviewed and revised the Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation. The Work Plan will be submitted to the NPAFC for consideration.

Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

Exchange of data and information in accordance with the information-sharing and data confidentiality policies of each Commission;

- Create a SharePoint inter-commission communication system to share news, reports, guideline documents, and other information relevant to the management of the mutual area of interest in an easily accessible form.

Timeline	Deliverables	Milestones
August 2021–June 2022	NPAFC/NPFC Sharepoint Terms of Reference to describe structure, capabilities, access rights, and control issues NPAFC/NPFC Sharepoint service in a test mode NPAFC/NPFC Sharepoint service in full operational mode	Terms of Reference (ToR) agreed by both commissions – September 15, 2021 Test mode – December 31, 2021 Full operational mode – June 30, 2022

- Establish a mechanism of general information exchange (e.g., MCS activity information, fleet activity information, map of catch and fishing efforts).

Timeline	Deliverables	Milestones
August 202 2 ⁴ –December 202 3 ²	NPAFC/NPFC communication and information exchange plan Regular mutual email conferences to exchange MCS and enforcement activities information	A plan agreed by the commissions – First half of 202 3 ² Summer–autumn of 202 3 ²
2022–2025	NPFC historical footprint (catch and fishing efforts) of the fisheries	Pacific saury, Japanese sardine, chub and blue mackerels, Japanese flying squid, neon flying squid,

Annex HH: Redrafted NPAFC Work Plan

	<p>Annual data reporting/sharing of Pacific salmon as by-catch by NPFC fishing vessels <u>(voluntary)</u></p> <p>Interactive Mapping System (IMS) for the INPFC/NPAFC High-Seas Salmonid Tag-Recovery Database</p>	<p>North Pacific armorhead, splendid alfonsino – available on the NPFC website</p> <p>IMS in a test mode with limited access – May 2022.</p> <p>IMS in full operational mode – May 2023</p>
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- Establish a practice of sharing information on suspicious fishing vessels identified in overlapping convention area including stateless vessels and unregistered vessels.

Timeline	Deliverables	Milestones
August 2021–June 202 2 ³	Vessel of Interest folder which has been treated as confidential at the NPAFC/NPFC Sharepoint	<p>Vessel of Interest folder description is included in the ToR agreed by the commissions – September 15, 2021</p> <p>Vessel of Interest information is included in the folder – June 30, 2022</p>

Collaboration on research efforts relating to stocks and species of mutual interest, including stock assessments;

- Implement Pan-Pacific research survey plans in winter 2022, organize a comprehensive study of its outcome at the special session of the IYS Synthesis Symposium.

Timeline	Deliverables	Milestones
August 2021–February 2022	NPFC suggestions to the NPAFC Pan-Pacific High Seas	NPFC proposal submitted to the NPAFC – November

Annex HH: Redrafted NPAFC Work Plan

	<p>Research Expedition cruise plans.</p> <p>NPFC participation in the country leads meetings to coordinate/contribute to the Expedition plans</p>	<p>2021</p> <p>[Status: The proposal was presented at the NPFC country leads meeting on 13 October and then revised by the NPFC SC following the feedback from the meeting.]</p> <p>NPFC Science Manager / Scientific Committee Chairperson participates in the country leads meetings in August 2021–February 2022</p> <p>NPAFC presented a report on the expedition finding after its completion in 2022</p>
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- ~~Harmonize~~ Coordinate research activities identified in the NPFC/PICES and NPAFC/PICES Frameworks for Enhanced Scientific Cooperation in the North Pacific Ocean.

Timeline	Deliverables	Milestones
October 2021–May 2023	<p>Harmonization—Coordination of the research activities identified in the NPFC/PICES and NPAFC/PICES Frameworks agreed—with PICES</p> <p>First draft and final version of the— NPAFC/NPFC/PICES Framework for— Enhanced Scientific Cooperation in the North Pacific Ocean</p>	<p>PICES—Annual Meeting in October 2021<u>2022</u>, a Study Group is created</p> <p>First—draft Framework is produced by the Study Group— <u>July 2022</u><u>2023</u></p> <p>Final version of Framework is adopted by NPAFC, NPFC, and PICES— <u>May 2023</u><u>2024</u></p>

Implementation of conservation and management measures for stocks and species of mutual

interest;

- Establish a mechanism to share the IUU vessel list of each Commission and its related information.

Timeline	Deliverables	Milestones
August 2021–May 2022	Accessible links to the NPAFC and NPFC IUU vessel list on both Commissions’ website	NPAFC is developing the IUU vessel listing process with a study group, and the NPAFC IUU vessel list is expected to be established for the first time – May 2022

- Expand cooperation to collect and share information relating to species of special interest for each Commission.

Timeline	Deliverables	Milestones
August 2021–December 2025	Information exchange on research cruise plans that can collect information on Pacific salmon and NPFC priority species Mutual scientific documents and publications on Pacific salmon and NPFC priority species distribution, relationships, and potential impact	Lists of scientific cruise plans are exchanged – May 2022 NPAFC/NPFC/PICES Topic Session (or Workshop) on this issue is proposed for October 2022 –2023 at the PICES Annual Meeting Mutual scientific documents and publications on Pacific salmon and NPFC priority species are published in 2023–2025

- Develop, publish, and distribute public information about conservation on the high seas and consequences of IUU activity.

Timeline	Deliverables	Milestones
2021–2025	News releases and journal articles on the Commissions activities related to high seas resources conservation, MCS,	Secretariats annually exchange information on the relevant publications

Annex HH: Redrafted NPAFC Work Plan

	and law enforcement	
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For each agreed item a timeline, milestones, and deliverables will be mutually developed. Work plan will be discussed by the commissions and mutually agreed before June 2022.



**Partnership Arrangement
providing for international cooperation in
the development and maintenance of the
Fisheries and Resources Monitoring System
(FIRMS)**



PREAMBLE

WHEREAS the Code of Conduct for Responsible Fisheries:

- provides guidance which may be used where appropriate in the formulation of international agreements and other legal instruments, both binding and voluntary;
- calls for the promotion of international cooperation and coordination in all matters related to fisheries, including information gathering and data exchange, and fisheries research, management and development; and
- recognises that the special requirements of developing countries in implementing the Code need to be taken into account.

RECOGNIZING that partnerships between international and national institutions will assist in meeting the objectives of the Code of Conduct for Responsible Fisheries, including the implementation of International Plans of Action approved by the Committee of Fisheries of the Food and Agriculture Organization of the United Nations (FAO) and the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries.

RECOGNIZING ALSO that such partnerships may occur at many levels, including

- global and regional fisheries organisations and arrangements (Regional Fishery Bodies);
- national agencies and research institutions; and
- global and regional network partners providing complementary information.

NOTING that international and national fisheries institutions have a wide variety of mandates and responsibilities, which may change over time, and that Partnerships should be in conformity with such mandates and responsibilities and adapt to new and changing institutional circumstances, as appropriate. Also noting that the Regional Fishery Bodies have a general obligation to disseminate information on the status of fisheries and fish stocks, or to provide assistance to their Member Countries for that purpose.

TAKING INTO CONSIDERATION the (**Note:** *agreement, memorandum of understanding, or exchange of letters concerning these recognitions; and noting the appropriate detail*) that exists between the partners to

Annex II: FIRMS Partnership Arrangement

this arrangement.

NOW THEREFORE the North Pacific Fisheries Commission (hereinafter, the 'Partner'¹) and the FAO, as a partner acting in the interest of furthering the objectives of FIRMS, have agreed to enter into this Partnership Arrangement:

- to establish the rights, responsibilities and obligations of the Partners; and
- to specify in detail the provisions on the nature, scope and conditions under which information is made available.

Article 1. OBJECTIVES OF THE PARTNERSHIP ARRANGEMENT

1.1 The principal objective of the FIRMS Partnership Arrangement ("the Arrangement") is to establish a framework between the Partners as listed in Annex 1 that will promote development and extension of fisheries status and trends reporting to all fisheries resources by:

- 1.1.1 building a community of responsible institutions that will report in an objective way on fisheries status and trends, thus contributing to the promotion of responsible fisheries management; and
- 1.1.2 developing, sharing and maintaining services for the collation, management and dissemination of information through a System for Fisheries and Resources Monitoring (FIRMS), hereafter referred to as the "FIRMS Partnership".

Article 2. PRINCIPLES OF THE PARTNERSHIP ARRANGEMENT

2.1 The Arrangement is based on the following principles:

- 2.1.1 information on fisheries is shared and appropriately disseminated;
- 2.1.2 information contributions related to fisheries remain within the full control and ownership of the Partner which has primary monitoring or management responsibility over resource and fishery units, including control of what and when information is made available, and how it is processed; and
- 2.1.3 whenever possible, the Partner will maintain the documentation on information sources, ownership, data origins and collection methodologies, and on their rules on dissemination and publication.

Article 3. PARTNERS RESPONSIBILITIES

- 3.1 FAO will provide the Secretariat to the FIRMS Steering Committee ("FSC"). The Secretariat will have the following responsibilities:
- 3.1.1 to support the FSC, in the performance of its functions and responsibilities which are described in Article 5 of this Arrangement;
 - 3.1.2 to implement decisions of the FSC in accordance with the Information Management Policy and the Rules of Procedures adopted by the FSC;
 - 3.1.3 to coordinate and administer financial inputs, in conformity with FAO Financial Rules and Regulations, for the development of FIRMS and for the conduct of this Partnership;
 - 3.1.4 to maintain databases for the presentation of fishery information;
 - 3.1.5 to make available the information provided under this Arrangement to Partners and other interested parties as may be decided upon by the FSC;
 - 3.1.6 to supervise the implementation of FIRMS Partnership services, including
 - 3.1.6.1. the application of systems of information quality control for presentation and consistency purposes;
 - 3.1.6.2. the development and implementation of software and information methodologies; and
 - 3.1.6.3. the development and implementation of training tools and methods, and the conduct of training, as appropriate.
 - 3.1.7 where required, to receive and process information inputs from a Partner, in particular for developing country institutions;
 - 3.1.8 where required, to collate, control and process information on the status and trends of fisheries; and
 - 3.1.9 to seek to ensure that the FIRMS Partnership will include global level information on the status and trends of fisheries in accordance with information management policies adopted by the FSC.
- 3.2 The Partners will contribute to FIRMS according to their mandate. To this effect the Partners will be responsible *inter alia*, for:
- 3.2.1 presenting for inclusion in FIRMS databases fishery assessment and management reports, statistics and other related information in a timely manner and according to its own policies on ownership, transparency and quality assurance, as referred to in Annex 2;

Annex II: FIRMS Partnership Arrangement

- 3.2.2 collating fishery information, or establishing databases jointly with FAO or with others;
- 3.2.3 ensuring collaboration with and participating in the work of the FSC, including in the identification of information that will complement each Partner's information sources and prevent duplication, and in attending meetings of the FSC.

Article 4. PARTNERS BENEFITS AND RIGHTS

- 4.1 The general benefits of the Arrangement are to enable the Partners:
 - 4.1.1 to assist them in fulfilling their commitment to improving transparency and accuracy of information on the status and trends of fisheries, while respecting confidentiality and security under which the information has been submitted, in ways that satisfy the owners of information concerned.
 - 4.1.2 to make available to the public, through dissemination channels referred to in Annex 2, information on fisheries status and trends in ways that provide background for, and facilitate interpretation of, fishery resources assessments and fishery management advisory reports. This information covers, *inter alia*:
 - 4.1.2.1. the distribution and population dynamics of a fishery resource;
 - 4.1.2.2. the techniques, nature, conduct and production of the fisheries for that resource;
 - 4.1.2.3. the fishery management systems in place or being developed, and
 - 4.1.2.4. indicators of the effect of such management.
- 4.2 In addition to what may be provided for in Annex 2, the Partner will, for FIRMS purposes, have access to:
 - 4.2.1 FIRMS tools for the editing, dissemination and maintenance of information;
 - 4.2.2 FIRMS information and databases beyond the restrictions normally applied under FAO dissemination policy, e.g. to geographic information system (GIS) layers or other value-added products;
 - 4.2.3 FIRMS Secretariat services for training in the use of information tools and standards, for use of the shared software library and other information products.

Article 5. INSTITUTIONAL ARRANGEMENTS

Annex II: FIRMS Partnership Arrangement

5.1 Eligibility of partners

5.1.1 National institutions, mandated by a national government, and intergovernmental bodies, that hold responsibilities for the preparation or publication of fisheries information relevant to the framework of the partnership may become a Partner.

5.1.2 Only one institution per country endorsed by its national government may become a FIRMS Partner. That institution may act as focal point to other institutions in a given country, as appropriate.

5.2 A Partner will cease to be a FIRMS Partner and deemed to have withdrawn from the Arrangement following a declaration made by the FSC in accordance with article 5.4.5.

5.3 FIRMS Steering Committee (FSC)

5.3.1 The FSC will be constituted of one member nominated by each Partner, including FAO in its capacity of Partner.

5.3.2 The FSC will be activated when the FIRMS Partnership enters into force.

5.4 In administrative matters, the FSC will:

5.4.1 meet at regular intervals, as appropriate or required in accordance with its Rules of Procedure.

5.4.2 adopt its Rules of Procedure and any amendment thereof;

5.4.3 make decisions according to the Rules of Procedure within the scope of this Partnership Arrangement.

5.4.4 identify potential partners that will contribute to the achievement of the FIRMS objectives, and prioritise their eligibility, with a view to ensure that:

5.4.4.1. their fisheries information reporting complements what FIRMS already covers;

5.4.4.2. their internal information policies are in conformity with quality assurance rules and standards provided for in the FIRMS Information Management Policy referred to in 5.5.4;

5.4.4.3. their mandate is within the FIRMS thematic scope; and

5.4.4.4. the additional workload generated can be absorbed by the FIRMS Secretariat.

5.4.5 declare a Partner as having withdrawn from the Arrangement based on the inactivity of the Partner in FIRMS; and

5.4.6 discuss with and advise its members and FIRMS Secretariat on any other matters pertaining to FIRMS.

5.5 In technical matters, the FSC will:

Annex II: FIRMS Partnership Arrangement

- 5.5.1 monitor the development and performance of FIRMS and advise on improvements;
- 5.5.2 consider Partners' requests on additional analyses or presentations;
- 5.5.3 discuss, advise and take decisions on further system developments;
- 5.5.4 formulate, adopt and keep under review the Information Management Policy;
- 5.5.5 review and comment upon the resources made available for the furthering of FIRMS objectives whether in kind or financial, and advise the FIRMS Secretariat on their allocation.

5.6 Cost sharing of the FIRMS Partnership

- 5.6.1 FAO will cover the costs of FIRMS development, FSC administration and the provision of the Partner entitlements under the Arrangement through regular and trust fund arrangements, to the extent that these funds allow and in accordance with its Financial Rules and Regulations.

5.6.2 The Partner will cover the costs of information contributions to FIRMS, attendance at FSC meetings and additional FIRMS services, which might include information system functionality or customisation for the specific use of the Partner, to the extent that funds have been allocated thereto.

5.7 Entry into force, amendment and termination of this arrangement

- 5.7.1 The Arrangement will enter into force on the date of signature of five Partners.
- 5.7.2 A Partner may withdraw from this arrangement, after giving three months notice to the FIRMS Secretariat which will inform the other Partners.
- 5.7.3 FAO may terminate its service as the FIRMS Secretariat. FAO will give twenty-four months notice to FSC before this termination.
- 5.7.4 The Arrangement may be amended or terminated with the consensus of all Partners.
- 5.7.5 The FSC will hold a first session within one year from the date of entry into force of this arrangement.

Article 6. MISCELLANEOUS

- 6.1 Annex 2 is an arrangement specific to each signing Partner and may be reviewed and amended as appropriate by the signing Partner in collaboration with the FIRMS Secretariat.

Annex II: FIRMS Partnership Arrangement

IN WITNESS WHEREOF, the Partners affix their signatures:

Signature:

Name:

Position:

Date:

For and on behalf of: **North Pacific Fisheries Commission**

Signature:

Name:

Position:

Assistant Director-General,
Fisheries and Aquaculture
Department,
Food and Agriculture

Date:

For and on behalf of: **Secretariat: on behalf of the FIRMS Partnership**

Annex 1: FIRMS Rules of Procedure

<http://www.fao.org/3/ca6051en/ca6051en.pdf>

Annex 2

Information to be contributed to FIRMS by The North Pacific Fisheries Commission (NPFC)

1. DATA AND STATISTICAL INFORMATION

Types of information to be contributed. The information to be contributed to FIRMS by NPFC will be taken from the Annual Reports of the meetings of the Commission and the Scientific Committee. The reports of the meetings of the Scientific Committee contain the latest advice to the Commission, including information on the biology, description of fisheries (including catches), state of stocks, outlook and management advice of fishery stocks in the NPFC Convention Area. NPFC may also contribute other information which is published by NPFC and available in the public domain data set. The contributions by NPFC will not include the detailed datasets (non-public domain data) which underpin the work of the Commission, Scientific Committee and Working Groups.

Scope of information to be contributed. NPFC will contribute information on marine living resources and fisheries in the North Pacific Ocean, which fall within NPFC's mandate and have been considered by the Commission and Scientific Committee. Table 1, which provides the list of marine resources and fisheries monitored by NPFC at the time of the signature of this document, may be occasionally updated.

Standards to be used in this Partnership Agreement. The information to be contributed by NPFC will conform, where possible, with the Information Management Policy¹ established by the FIRMS Steering Committee. The contributions by NPFC shall be managed using standards that do not alter the integrity of NPFC's Annual Reports and other publications.

2. METADATA AND INFORMATION MANAGEMENT

Methods of collection and processing. Information on NPFC's data collection and management is available in the Annual Reports. Further information and links to detailed information may be found on the NPFC website (<https://www.npfc.int/>).

¹ FIRMS Information Management Policy <https://www.fao.org/3/ax530e/ax530e.pdf>

Annex II: FIRMS Partnership Arrangement

The Scientific Committee and its Working Groups meet every year to review the fishery and ecosystem assessments using the best information available. The Scientific Committee usually meets in December. The Scientific Committee reviews the fishery assessments and management recommendations and, in turn, provides advice to the Commission in the form of a report which the Scientific Committee adopts by consensus.

The text of the report of the Scientific Committee is carefully drafted and agreed by scientific representatives from Member Countries. The processing and management of this information within FIRMS will be conducted in such a way that the integrity of these reports, and all other NPFC publications, will be fully always maintained.

Bibliographical sources. The main bibliographical source for the contributions to FIRMS is the Annual Reports of the Commission and Scientific Committee, published by NPFC and available on the NPFC website.

Ownership and responsibilities. The information contributed to FIRMS by NPFC resides under the full ownership and responsibility of NPFC. With reference to the FIRMS standards, the ownership presented as header of each NPFC fact sheet will clearly include “North Pacific Fisheries Commission” as the data owner entity, and the “North Pacific Fisheries Commission” (acronym NPFC) as the institutional body under which this entity operates.

The acronym used throughout FIRMS will be NPFC. Further, NPFC will be the owner of all descriptions of itself, its areas of competence, and all text outlining its responsibilities and accomplishments, wherever presented by pages linked to or referenced by FIRMS, including pages developed by other organisations or entities. This shall be accomplished by appropriate editorial and ownership security privileges within FIRMS under a dedicated fact sheets collection “NPFC Reports”. Methods used in authentication and verification of information for FIRMS will identify both a NPFC editor and a NPFC approver. The editor and approver will in sequence ensure that fact sheets owned by NPFC are updated and linked to the latest version of NPFC documents and information as they are released.

Processing methods. n/a

Transmission protocols and dissemination channels.

Conditional on the availability of resources at the NPFC Secretariat, information provided by NPFC will be updated within 12 months of the publication of the Annual Reports of the Commission and Scientific Committee.

3. DATA AND INFORMATION SECURITY

All information provided by NPFC will be in the form of published reports and other documents which are in the public domain. Therefore, no confidentiality issues are foreseen with this information.

4. COLLABORATIVE INSTITUTIONS

NPFC is the FIRMS signatory partner and as such does not include any collaborative institution.

5. ADDITIONAL ENTITLEMENTS

NPFC Secretariat staff will be entitled to participate in workshops or special courses organized by the FIRMS Secretariat on the use of the electronic publishing tools used by FIRMS. When further partnership efforts need to be extended this item may be revised by mutual consent.

Table 1: List of marine resources and fisheries for the (draft) NPFC Stocks and Fisheries inventory

NPFC Stocks and Fisheries inventory (DRAFT)	
Marine Resources	Fisheries
North Pacific armorhead	Bottom trawl fishery
Splendid alfonsino	Bottom gillnet fishery
Pacific saury	Bottom longline fishery
Neon flying squid	Seamount long-line fishery
Japanese flying squid	Pacific saury fishery
Chub mackerel	Chub mackerel fishery
Spotted mackerel	Neon Flying Squid and Japanese Flying Squid fishery
Japanese sardine	Japanese sardine fishery



Memorandum of Understanding between the North Pacific
Fisheries Commission (NPFC) and the Western and Central
Pacific Fisheries Commission (WCPFC)

The North Pacific Fisheries Commission (hereafter NPFC) and the Western and Central Pacific Fisheries Commission (hereafter WCPFC):

Acknowledging that the objective of the Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur

Acknowledging also that the objective of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (hereafter WCPF Convention) is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific ocean;

Recognising that Article 22 of the WCPFC Convention calls upon the WCPFC to make suitable arrangements for consultation, cooperation and collaboration with other relevant intergovernmental organizations;

Recognising further that Article 21 of the NPFC Convention calls upon the NPFC to take into account the conservation and management measures or recommendations adopted by regional fisheries management organizations and arrangements and other relevant intergovernmental organizations that have competence in relation to areas adjacent to the NPFC Convention;

Conscious of the fact that there is a geographical area overlap within the Convention Areas of both the NPFC and the WCPFC;

Noting that provisions of both the NPFC and the WCPF Conventions address the conservation of non-target, associated or dependent species which belong to the same ecosystem as the target species;

Desiring to put in place a mechanism to promote and facilitate cooperation between WCPFC and NPFC;

Therefore NPFC and WCPFC record the following understandings:

1. OBJECTIVE OF THIS MEMORANDUM

The objective of this MoU is to facilitate, where appropriate, cooperation between NPFC and WCPFC ('the Organisations') in order to advance their respective objectives, particularly with respect to stocks or species which are within the competence or mutual interest of both Organisations.

2. AREAS OF COOPERATION

The Organisations will establish and maintain consultation, cooperation and collaboration in respect of matters of common interest to both organisations, including but not limited to, the following areas:

- i. exchange meeting reports, information, documents and publications regarding matters of mutual interest, consistent with the information sharing policies of each organization;
- ii. exchange data and scientific information in support of the work and objectives of both Organisations, consistent with the confidentiality rules, information sharing policies and internal data security procedures of each Organisation including, but not limited to, information on:
 - a) vessels authorised to fish in accordance with conservation and management measures adopted under the NPFC and WCPFC Conventions;
 - b) at the specific request of one of the Organisations, transshipment activities of those vessels authorised to conduct transshipment in accordance with conservation and management measures adopted under the NPFC and WCPFC Conventions, on a necessity basis; and,
 - c) vessels identified as having engaged in illegal, unreported and unregulated (IUU) fishing activity and the IUU Vessel Lists established by each Organisation.
- iii. collaborate, where appropriate, on research efforts relating to species and stocks of mutual interest, including non-target, associated and dependent species;
- iv. cooperate where appropriate, on the implementation of conservation and management measures adopted under the NPFC Convention and under the WCPFC Convention;
- v. share best practices in areas of mutual interest, including but not limited to:
 - a) monitoring, control and surveillance policies and systems, including with respect to Vessel Monitoring Systems;
 - b) administration, auditing, training and structure of observer programmes; and
 - c) Compliance Monitoring Schemes, and information management systems.
- vi. exchange on expertise gained, lessons learned and use of best practices between the Organisations' Secretariats in their areas of activity.
- vii. consistent with each Organisation's rules of procedure, grant reciprocal observer status to representatives of the respective Organisations in relevant meetings of each Organisation, including those of each Organisation's subsidiary bodies;

3. CONSULTATIVE PROCESS

To facilitate effective development, implementation and enhancement of cooperation, the Organisations may establish a consultative process between their respective Secretariats that includes telephone, email and any other means of communication. The consultative process may also proceed in the margins of meetings at which both Organisations’ Secretariats are represented by appropriate staff.

4. MODIFICATION

This MoU may be modified at any time with the mutual written consent of both Organisations.

5. LEGAL STATUS

This MoU does not create legally binding rights or obligations. Each Organisation should cover their own costs related to the implementation of this MoU.

This MoU does not alter the obligations of members of either Organisation to comply with the conservation and management measures adopted under their respective Conventions.

6. OTHER PROVISIONS

This MoU will commence on the date of the second signature.

Either Organisation may discontinue this MoU by giving six months’ prior written notice to the other Organisation.

7. SIGNATURES

Signed on behalf of the North Pacific Fisheries Commission and the Western and Central Pacific Fisheries Commission:

FOR THE NORTH PACIFIC FISHERIES
COMMISSION (NPFC)

FOR THE WESTERN AND CENTRAL PACIFIC
FISHERIES COMMISSION (WCPFC)

Robert Day
Executive Secretary

Rhea Moss-Christian
Executive Director

Place:

Place:

Date:

Date:



Memorandum of Understanding between the South Pacific Regional Fisheries Management Organisation (SPRFMO) and the North Pacific Fisheries Commission (NPFC)

The South Pacific Regional Fisheries Management Organisation (hereafter SPRFMO) and the North Pacific Fisheries Commission (hereafter NPFC):

Acknowledging that the objective of the Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean (hereafter SPRFMO Convention) is, through the application of the precautionary approach and an ecosystem approach to fisheries management, to ensure the long-term conservation and sustainable use of fishery resources and, in so doing, to safeguard the marine ecosystems in which these resources occur;

Acknowledging also the objective of the Convention on the [Conservation and Management and management of High Seas Fisheries Resources in the North Pacific Ocean Fisheries Commission](#) (hereafter NPFC Convention) is to ensure the long-term conservation and sustainable use of the fisheries resources in the [Convention Area North Pacific Ocean while protecting and in so doing safeguard](#) the marine ecosystems [of the North Pacific Ocean](#) in which these resources occur;

Recognising that Article 21 of the NPFC Convention requires [the NPFC](#) to cooperate, as appropriate, on matters of mutual interest with relevant regional organizations or arrangements, especially with those regional fisheries management organizations or arrangements with responsibility for fisheries in marine areas near or adjacent to the NPFC Convention Area;

Recognising further that Article 21 of the NPFC Convention calls upon the NPFC to take into account the conservation and management measures or recommendations adopted by regional fisheries management organizations and arrangements and other relevant intergovernmental organizations that have competence in relation to areas adjacent to the NPFC Convention [Area](#);

Recognising also that Article 31 of the SPRFMO Convention requires the SPRFMO Commission, *inter alia*, to cooperate, as appropriate, with other relevant organisations on matters of mutual interest and to seek to make suitable arrangements for consultation, cooperation and collaboration with such other organisations;

Conscious of the fact that the areas that fall within the purviews of the SPRFMO Convention and NPFC Convention are geographically adjacent [to each other](#);

Noting that both the SPRFMO and the NPFC have conservation and management principles and approaches addressing non-target, associated, or dependent species which belong to the same ecosystem as the target species;

Desiring to put in place a mechanism to promote and facilitate cooperation, [between](#) SPRFMO and NPFC; [have agreed intend to](#) enter into the following Memorandum of Understanding (MoU):

1. OBJECTIVE OF THIS MEMORANDUM

The objective of this MoU is to facilitate, where appropriate, consultation, cooperation, and collaboration

between SPRFMO and NPFC ('the Organisations') in order to advance their respective objectives, particularly with respect to matters of common interest.

2. AREAS OF COOPERATION

The Organisations should establish and maintain consultation and cooperation in respect of matters of common interest. In particular, the Organisations intend to:

- i. exchange meeting reports, information, documents, and publications regarding matters of mutual interest, consistent with the confidentiality rules and information sharing policies of each Organization;
- ii. exchange data and scientific information in support of the work and objectives of both Organisations, consistent with the confidentiality rules, information sharing policies, and internal data security procedures of each Organisation including, but not limited to, information on:
 - a) vessels authorised to fish in accordance with conservation and management measures adopted under the SPRFMO and NPFC Conventions;
 - b) vessels identified and listed as having engaged in ~~suspected of~~ illegal, unreported, and unregulated (IUU) fishing activity and the IUU Vessel Lists established by each Organisation;
 - ~~c) relevant stocks and species consistent with data use, access, and confidentiality rules of each Organisation;~~
 - ~~d) identified dying scientific cooperation synergies between the SPRFMO multiannual scientific work plan and the NPFC research plans, and where appropriate, co-sponsoring existing/new scientific research on of mutual interest.~~
- iii. cooperate, where appropriate, on research efforts relating to species and stocks of mutual interest, including non-target, associated and dependent species.
- ~~iii.~~iv. share best practices ~~cooperate to harmonise approaches~~ in areas of mutual interest and concern, including, but not limited to:
 - a) ~~reporting and mitigation of~~ addressing bycatch of non-target, associated, and dependent species (ecologically related species);
 - b) monitoring, control, and surveillance policies and systems, including with respect to Vessel Monitoring Systems;
 - c) administration and structure of observer programmes, including information management policies;
 - d) compatibility of the conservation and management measures adopted by the Organisations.
- ~~iv.~~v. consider methods of recognising and supporting conservation and management measures adopted under the SPRFMO Convention and the NPFC Convention;
- ~~v.~~vi. exchange on ~~cooperate to in~~ recommending methods to -strengthen the compliance review procedures in accordance with each Organisation's Compliance and Monitoring Scheme;
- ~~vi.~~vii. consistent with each Organisation's rules of procedure and other relevant policies, grant reciprocal observer status to representatives of the respective Organisations in relevant meetings of each Organisation, including those of each Organisation's subsidiary bodies;
- ~~vii.~~viii. exchange on ~~an~~ expertise gained, lessons learned, and use of best practices between the Organisations' Secretariats in their areas of activity.

3. CONSULTATIVE PROCESS

Annex KK: Draft MOU with SPRFMO

To facilitate effective development, implementation, and enhancement of cooperation, the Organisations may establish a consultative process between their respective Secretariats that includes telephone, email, and any other means of communication. The consultative process may also proceed in the margins of meetings at which both Organisations' Secretariats are represented by appropriate staff.

4. MODIFICATION

This MoU may be modified at any time by the mutual written consent of both Organisations.

5. LEGAL STATUS

This MoU does not create legally binding rights or obligations. Each Organisation should cover their own costs related to the implementation of this MoU.

This MoU does not alter the obligations of members of either Organisation to comply with the conservation and management measures adopted under respective Conventions.

6. OTHERS

This MoU should commence on the date of the second signature.

Either Organisation may terminate discontinue this MoU by giving six months' prior written notice to the other Organisation.

This MoU should operate for three (3) years. Before the end of the three-year period, the Organisations will separately review the operation of this MoU to decide whether it should be renewed.

7. SIGNATURES

Signed on behalf of the South Pacific Regional Fisheries Management Organisation and the North Pacific Fisheries Commission:

FOR THE NORTH PACIFIC FISHERIES
COMMISSION (NPFC)

FOR THE SOUTH PACIFIC REGIONAL FISHERIES
MANAGEMENT ORGANISATION (SPRFMO)

~~Dae Yeon Moon~~

Robert Day

Executive Secretary

~~Sebastián Rodríguez Alfaro~~

Craig Loveridge

Executive Secretary

Place:

Place:

Date:

Date:



Memorandum of Understanding between the North Pacific Fisheries Commission (NPFC) and the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC)

The North Pacific Fisheries Commission (hereafter NPFC) and the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (hereafter ISC):

Acknowledging the objective of the Convention on the North Pacific Fisheries Commission (hereafter NPFC Convention) is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur;

Recognising that Article 21 of the NPFC Convention requires to cooperate, as appropriate, on matters of mutual interest with relevant regional organizations or arrangements, especially with those regional fisheries management organizations or arrangements with responsibility for fisheries in marine areas near or adjacent to the NPFC Convention Area;

Acknowledging that the ISC was established to enhance scientific research and cooperation for conservation and rational utilization of the species of tuna and tuna-like fishes which inhabit the North Pacific Ocean during a part or all of their life cycle;

Recognising that the ISC maintains a central database to support the scientific research in the North Pacific Ocean;

Conscious of the fact that there is a geographical area overlap within the Convention Area of the NPFC and the ISC;

Noting that both the NPFC and the ISC address non-target, associated or dependent species which belong to the same ecosystem as the target species;

Desiring to put in place a mechanism to promote and facilitate cooperation between NPFC and ISC; intend to enter into the following Memorandum of Understanding (MOU):

1. OBJECTIVE OF THIS MEMORANDUM

The objective of this MOU is to facilitate, where appropriate, consultation, cooperation and collaboration between NPFC and ISC ('the Organisations') in order to advance their respective objectives particularly with respect to stocks or species which are within the competence or mutual interest of both Organisations.

2. AREAS OF COOPERATION

The Organisations should establish and maintain consultation and cooperation in respect of matters of common interest. In particular, the Organisations intend to:

- i. exchange meeting reports, information, documents and publications regarding matters of mutual interest, consistent with the confidentiality rules and information sharing policies of each organization;
- ii. exchange data and scientific information in support of the work and objectives of both Organisations, consistent with the confidentiality rules, information sharing policies and internal data security procedures of each Organisation including, but not limited to, information on:
 - a) relevant stocks and species consistent with data use, access and confidentiality rules of each Organisation;
 - b) effects of climate changes on marine ecosystems in the North Pacific Ocean.
- iii. collaborate, where appropriate, on research efforts relating to species and stocks of mutual interest, including non-target, associated and dependent species
- iv. exchange on expertise gained, lessons learned and use of best practices in their areas of activity;
- v. consistent with each Organisation's rules of procedure, grant reciprocal observer status to representatives of the respective Organisations in relevant meetings of each Organisation, including those of each Organisation's subsidiary bodies.

3. CONSULTATIVE PROCESS

To facilitate effective development, implementation and enhancement of cooperation, the Organisations may establish a consultative process between their respective Secretariats that includes telephone, email and any other means of communication. The consultative process may also proceed in the margins of meetings at which both Organisations' Secretariats are represented by appropriate staff.

4. MODIFICATION

This MoU may be modified at any time with the mutual written consent of both Organisations.

5. LEGAL STATUS

This MoU does not create legally binding rights or obligations. Each Organisation should cover their own costs related to the implementation of this MoU.

6. OTHERS

This MoU should commence on the date of the second signature.

Either Organisation may discontinue this MoU by giving six months' prior written notice to the other Organisation.

7. SIGNATURES

Signed on behalf of the North Pacific Fisheries Commission and the International Scientific Committee.

FOR THE NORTH PACIFIC FISHERIES
COMMISSION (NPFC)

FOR THE INTERNATIONAL SCIENTIFIC
COMMITTEE (ISC)

Robert Day
Executive Secretary

John Holmes
ISC Chair

Place:

Place:

Date:

Date:

NPFC Document Policy

Abstract. *This policy is intended to ensure a common system is employed to classify documents submitted to, or developed by, the NPFC and its subsidiary bodies . It establishes approaches for providing access to NPFC meeting documents by accredited observers. It describes document requirements, includes examples which can be used as templates and provides guidelines for submission of NPFC documents.*

TYPES OF NPFC DOCUMENTS

Working Papers (WP) are documents generated by the Members or the Secretariat for consideration and discussion by the Members.

Information Papers (IP) are submitted by the Members and present information which may be useful for the Commission, does not require discussion, but may provide background for WPs.

Observer Papers (OP) are Information Papers submitted by Observers.

Meeting Information Papers (MIP) provide organizational support to participants, i.e. agenda, schedule, meeting venue etc.

Reference Documents (RD) include key NPFC documents relevant to the meeting (Convention, Rules of Procedure, CMMs etc.)

Meeting Reports (spelled out with the acronym of the meeting/workshop before wording, e.g., SSC PS01 Report/WS VME01 Report) summarize results of the meetings of the Commission and its subsidiaries.

Annual Reports (AR) are generated by the Members and describe how the Member of the Commission has implemented the conservation and management measures and monitoring, control and surveillance and enforcement procedures adopted by the Commission.

Compliance Monitoring Reports (CMR) are reports from the Secretariat on the assessment of Member's compliance with CMMs (confidential until approved).

Other documents are papers issued on an irregular basis and do not meet the above descriptions.

REQUIREMENTS FOR NPFC DOCUMENTS

All documents submitted to or developed by the NPFC and its subsidiaries shall include header (NPFC+logo), document number (appendix 1), page numbers, title, and, if appropriate, author(s) and affiliation. Specific requirements to different types of documents are as follows:

Working Paper shall have an abstract. It also *may* have cover page and citation that is strongly recommended for scientific papers which have not yet been published. Citation format:

“Author(s). Year. Title. Document number. # pp. (number of pages) Available at <http://www.npfc.int> (appendix 2)

Meeting Report shall have cover page and citation. Citation format: “NPFC or its subsidiary. Year. Title. Document number. # pp. (number of pages). Available at <http://www.npfc.int>” (appendix 3)

Annual Report shall have cover page and citation. Citation format: “Member. Year. Title. Document number. # pp. (number of pages). Available at <http://www.npfc.int>”. (appendix 4).

Compliance Monitoring Report *may* have cover page and citation, if necessary. Citation format: “Member. Year. Title. Document number. # pp. (number of pages). Available at <http://www.npfc.int>”

Reference Documents/Papers, Meeting Info Papers, Information Papers, Observer Papers and other NPFC documents do not have specific requirements but shall follow common rules for numbering and content for all documents noted above.

GUIDELINES FOR SUBMISSION OF NPFC DOCUMENTS

Submission

NPFC Documents must be prepared in English in electronic form and submitted to the Secretariat by email through the Commission’s point of contact in each Member.

All text, tables, and figures must be embedded in the file.

Document number

Annex MM: NPFC Document Policy

The Secretariat will assign a document number to completed documents in the order they are received. If a document is revised, the Secretariat will add “Rev #” in the end of document number and previous versions will be retained.

Citation

In case the document is not citable, insert one or any following sentences under the document number:

NOT TO BE CITED, or NOT TO BE CITED WITHOUT PERMISSION OF THE ISSUING AGENCY, and/or NOT TO BE DISTRIBUTED WITHOUT AUTHORIZATION OF THE ISSUING AGENCY.

Uploading on the Website

The Secretariat will upload submitted documents to the Meetings page of the NPFC website which will be accessible for Members, CNCPs and Observers. After the adoption of documents at the Annual Meeting, documents will be posted in the public area of the NPFC website. Documents determined to contain sensitive information shall remain solely on the Members’ Area of the website.

Deadlines

The Secretariat encourages the Members to follow deadlines for submission of documents as per Rules of Procedure to give others enough time for consideration and, therefore, make the Commission meetings more effective and productive.

Document type	Deadline	Clause of the NPFC Rules of Procedure
<i>Documents from the Members</i>		
Annual report	End of February	8.5
Compliance Monitoring Report	End of February	CMS CMM
Working Paper	30 days before the opening of the meeting	5.7.2

Annex MM: NPFC Document Policy

Working Paper (subsidiary bodies, 45 days ¹)	14 days before the opening of the meeting (except where meetings are coincidental)	5.7.3
<i>Documents from the Secretariat</i>		
Draft Provisional Agenda	90 days before the Meeting	5.1.1
Provisional Agenda	60 days before the Meeting	5.1.2
Meeting Papers	At least 14 days prior to the applicable Meeting	5.7.1.

Members, CNCPs and Observers are encouraged to submit meeting documents with as much advance notice as possible.

Documents submitted during the meeting will not be discussed at the meeting. They will be labeled as Information Papers for consideration by the Members. Members may, however, decide to reconsider them as Working Papers for full discussion.

DOCUMENTS AVAILABILITY AT THE MEETING

The Secretariat provides participants with the Meeting Information Papers at meeting registration. This document package includes Provisional Agenda, Annotated Indicative Agenda, and Meeting Information.

Secretariat will provide access to documents through the website for Members, CNCPs and Observers in advance of the meeting and in comparable timeframes. This access will take into account the appropriate confidentiality requirements..

¹ For documents or proposals that require the input of subsidiary bodies, and the meeting of such subsidiary body concluded within 45 days of the opening of a regular Commission meeting

Annex MM: NPFC Document Policy

Hard copy of other documents will not be available at the meeting unless a Member makes a request for up to two copies 14 days prior to the meeting. . Participants must either download the documents from the website to their own devices, or bring their own hard copy to the meeting.

NUMBERING FOR NPFC MEETING DOCUMENTS

The following is proposed for an official numbering scheme for NPFC meetings. These are based on the numbering scheme of the PrepCon and other RFMOs.

1. NPFC meetings

Reference Documents

Be referred by name only.

Meeting Info Papers

NPFC – year – COM+# mtg – MIP# (Rev. # if needed) – title

e.g., NPFC-2016-COM##-MIP01

Working Papers

NPFC – year – COM+# mtg – WP# (Rev. # if needed)

Information Papers

NPFC – year – COM+# mtg – IP# (Rev. # if needed)

Observer Papers

NPFC – year – COM+# mtg – OP# (Rev. # if needed)

Meeting Report

NPFC – year – COM+# mtg – Report (draft/final)

I

2. Annual Reports

NPFC-year-AR Member-(
)

Compliance Monitoring Report Summary

NPFC-year-CMR

Summary for the stock assessment of chub mackerel (Pacific stock) in 2015

by Ryuji Yukami

Stock Assessment Group, National Research Institute of Fisheries Science, Fisheries Research
Agency, Japan

March 2016

This paper may be cited in the following manner:

Yukami R. 2016. Summary for the stock assessment of chub mackerel (Pacific stock) in 2015. NPFC-2016-SC01-WP01 (Rev 1). 6 pp. (Available at www.npfc.int)

**1st meeting of the Small Scientific Committee on Pacific Saury
REPORT**

20-22 April 2016

May 2016

This paper may be cited in the following manner:

Small Scientific Committee on Pacific Saury. 2016. Meeting Report. NPFC-2016-SSC PS01-Final Report. 21 pp. (Available at www.npfc.int)

Annual Report for 2015

by Canada

February 2016

This paper may be cited in the following manner:

Canada. 2016. Annual Report for 2015. NPFC-2016-AR Canada (Rev 4). 10 pp.

INTERIM NPFC RULES OF TRANSPARENCY FOR TCC

- 1) Observer access to all TCC meetings including informal sessions and meetings of small working groups (SWG)

In the case of accredited observers (as listed in Rule of Procedure 9.1), attendance and participation in intersessional meetings, such as TCC Small Working Group meetings, will be in accordance with the following procedures:

- a) A Member may invite an observer to attend a SWG meeting, should the Member believe the meeting would benefit from the observer's attendance and participation. If a Member wishes to invite an observer, that Member should submit a proposal to the Secretariat at least 15 days prior to the meeting with information on how the participation of the observer may be beneficial to the particular meeting. The Secretariat will immediately notify all Members of this invitation. The observer may attend and participate in the meeting, unless a simple majority of the Members objects to the request within 7 days of the notification. If the Secretariat provides fewer than 15 days' prior notice of the meeting, the Member should submit its proposal as soon as possible, still allowing Members at least 7 days to review.
- b) An observer may request to be invited to attend a SWG meeting, either through a Member or directly to the Secretariat. That observer should submit a proposal to the Secretariat at least 15 days prior to the meeting with a statement on how the participation of the observer may be beneficial to the particular meeting. The Secretariat will immediately notify all Members of this proposal. The observer may attend and participate in the meeting, unless a simple majority of the Members objects to the request within 7 days of the notification. If the Secretariat provides fewer than 15 days' prior notice of the meeting, the observer should submit its proposal as soon as possible, still allowing Members at least 7 days to review.
- c) Meetings, or portions of meetings, may be closed to observers if the meeting or portion of the meeting:
 - i) would disclose commercial, financial or other operational information deemed privileged or confidential under NPFC's data security policy to be developed by the Commission;
 - ii) would disclose information on monitoring, control and surveillance, particularly on HSBI enforcement and fishery related activities data, including CMS and transshipment data, deemed privileged or confidential under NPFC's data security policy to be developed by the Commission;

Annex NN: Interim rules of transparency pertinent to TCC

- iii) would result in premature disclosure of drafts that are customarily kept confidential until published by the NPFC, including the IUU vessel list and the compliance reports, or;
- iv) relates solely to the internal rules and practices of the NPFC, such as personnel matters, that are required to be kept confidential by NPFC policy or applicable law.

2) Public access to all meeting documents

All meeting documents, such as Working Papers, Meeting Info Papers, Reference Documents/Papers, draft CMMs, and Observer Papers, but excluding draft and interim compliance reports, edits or comments from Members made on working documents, or other draft documents customarily kept confidential, will be made available to accredited observers. These meeting documents will be made available to observers in advance of the meeting as per the Rules of Procedure, and where not specified, on or around the same time as Commission Members. Materials developed during the meeting, as well as meeting minutes, will be made available to accredited observers upon completion of the meeting in a time consistent with Member access to the materials. The access of these meeting documents is subject to confidentiality rules adopted by the Commission, such as data security-related provisions in CMMs, or a general data sharing and security policy to be adopted.

These interim rules will remain in place until COM09, at which point the TCC SWGs will operate consistently with the Commission's Rules of Procedure, unless these interim rules are modified or extended.

NPFC STAFF SELECTION PROCESS

Introduction

NPFC Convention Article 5.9 and Staff Regulations 6, and Rules of Procedure 2.6, address the recruitment and appointment of Executive Secretary and staff, but do not specify the terms of staff and detailed process for selection of staff members. In the case of the Executive Secretary, his or her term of office shall be for four years, and he or she may be eligible for re-appointment, but shall not serve for more than eight (8) years unless otherwise decided by the Commission. There are no such rules available to other staff members hired by the Executive Secretary in accordance with Rule 6.2 and 6.4 of the Rules of Procedure of the Commission, except that the Executive Secretary shall appoint, direct, and supervise staff. It is the current practice that when staff members were hired, the Executive Secretary has made a contract with each Professional Staff for a four-year term, with the possibility of another four-year appointment depending on annual performance during the term of the staff. A similar principle was applied to General Staff who were appointed for a period of four (4) years initially, and the contract may be renewable for further periods based on the needs of NPFC, its funding situation and work performance during the term.

As the first term of the current four incumbents including the Executive Secretary ends during September 2019 - March 2020, it is suggested that the Commission provide transparent and clear guidelines for the Executive Secretary to ensure he/she is prepared for possible future selection of new staff Members.

The recent Salary Consultancy (NPFC-2018-FAC02-WP03) has also pointed out the lack of guidance on the term(s) of staff so recommended that the Commission give further consideration to the tenure of its staff, with a range of options practiced within other RFMOs. Therefore, the Secretariat suggests the following selection process of the NPFC Secretariat staff, including the term(s) of the staff appointed for Members' consideration.

Process for Hiring Staff Members

1) Executive Secretary

The Executive Secretary shall be hired by the Commission according to such procedures and on such terms and conditions to be decided by the Commission (Article 5.9 of the Convention, paragraph 6.1 Staff Regulations and paragraph 6.1 of the Rules of Procedure). The selection, interview and appointment process for the Commission's Executive Secretary is as follows.

Position documentation and advertisement.

Prior to advertising the vacancy, the Secretariat, in consultation with the Chair of the Commission, will prepare a draft position description for the post of Executive Secretary and a draft advertisement. These will be provided to the Members of the Commission for approval. The Secretariat will post the approved advertisement and position description on the NPFC website and in national and international publications and websites not less than one hundred and eighty (180) days before the coming Commission meeting. The recruitment page on the NPFC website will include relevant information regarding the vacancy and the application process. The deadline for applications to be received by the Secretariat shall be no less than 60 days after the advertisement has been placed on the website.

Submission of applications

Applications, as well as referee comments, must be submitted in the English language by eligible persons to the Chair through the Secretariat in electronic format.

Availability of applications

The Secretariat will circulate the applications received to all Members of the Commission.

Ranking of applicants

Each Member will provide to the Secretariat a list of their top five preferred applicants, in rank order, within 30 days of the distribution of the applications by the Secretariat. The Secretariat will prepare a composite list of the candidates based on the lists provided by the Members. In doing so, the Secretariat will aggregate individual applicants' rankings, awarding 5 points for a first preference, 4 points for second preference, etc.

Shortlist

The candidates with the five highest aggregate scores will be shortlisted for selection. Should the application of any candidate be withdrawn, the next ranking candidate will be substituted.

Interview process

The top five candidates will be invited to attend the Commission meeting for interviews. They will be interviewed by the Members during the Heads of Delegation meeting in the margins of the Commission meeting. Members will agree in advance on a set of questions that will be presented to each candidate. Following the interviews, each Member will once again be consulted as to its preferred candidates. If no candidate is the preferred candidate of a majority of the Members, the candidate with the lowest level of support will be dropped from the list and the voting process repeated until one candidate receives majority support. Upon identification of the preferred

Annex OO: NPFC Staff Selection Process

candidate in accordance with above process, the Commission shall appoint the Executive Secretary with the approval of the Contracting parties.

Appointment Process of the Executive Secretary

The chosen candidate will be notified at the conclusion of the Commission's meeting. Contract negotiations are to be conducted by the Commission's Chair. If possible, the chosen candidate will report to the Secretariat Office two full weeks before the departure of the incumbent Executive Secretary in order to allow for a transition.

Acting Executive Secretary

If the position of Executive Secretary shall become vacant during the intersessional period or if the Executive Secretary is unable to act, his/her powers and duties shall be assumed by one of the professional staff members designated by the Chair of the Commission until such time as a successor is appointed or the Executive Secretary is able to act. If appointed for longer than four weeks, the Acting Executive Secretary shall be compensated at the lowest increment of the salary scale for an Executive Secretary if the lowest increment is higher than the Acting Executive Secretary current salary.

2) Staff Members

The power of appointment of staff members rests with the Executive Secretary (Staff Regulations 6.2) and shall ensure that these processes are transparent, equitable and based on merit. Prior to advertising the vacancy, the Secretariat, in consultation with the Chair of the Commission, will prepare a draft position description for the post of the staff member and a draft advertisement. A selection panel, which may involve appropriately qualified and knowledgeable personnel external to the Secretariat, will be appointed by the Executive Secretary, who shall serve as Chair of the Selection Board, to advise on staff selection. Suitability for recruitment will be assessed in a transparent manner that takes account of (i) the international character of the Commission, (ii) the requirements of the position as described in its Duty Statement, (iii) the qualifications, experience, qualities and capabilities of applicants, (iv) testimonials from the applicant's referees, and (v) other sources of information regarding the applicant's suitability.

Appointment term(s)

Professional and General Service staff are appointed for an initial four-year term. Subject to satisfactory performance, and to the needs of the Commission, staff may be re-appointed.

Otherwise, the post will be re-advertised and the incumbent is eligible to apply.

General Service staff are initially appointed for a four-year term. Subject to satisfactory performance, and to the needs of the Commission, General Service staff may be re-appointed on an ongoing/permanent basis.

Annex OO: NPFC Staff Selection Process

The Executive Secretary may appoint short-term temporary personnel for a specific task following the UN guidelines for such appointments, which is normally six months maximum, and not more than 24 months in total, over a 36 month period, with appropriate breaks, or a maximum of 11 months per year with an appropriate break before any re-hiring to ensure that the short term staff cannot be legally considered as a full time employee nor receive such benefits.

Start Salary level

In accordance with Staff Regulation 6.4, the Executive Secretary shall negotiate with the staff selected for the starting salary level, based on qualifications and experience unless the Commission decides otherwise.

Probation Period

Staff members selected shall all be subject to a six-month probationary appointment. Upon satisfactory completion of the probationary period, the Executive Secretary shall confirm their appointment and the terms thereof. During that period, either party may terminate the appointment upon one month's written notice.

If the Executive Secretary does not confirm the appointment after the probation period due to poor performance of the selected candidate, staff selection process shall be repeated. The Executive Secretary may seek for consultancy or secondment during this period to ensure effective work of the Secretariat.

Consultants or short-term employees may be dismissed at any time for cause with final compensation subject to the decision of the Executive Secretary in considering the situation for termination of the consultancy.